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DISPOSAL OF HIGH-LEVEL NUCLEAR WASTE

HEARING

BEFORE THE

COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

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FIRST SESSION

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MATERIAL SUPPLIED FOR THE RECORD

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HIGH LEVEL RADIOACTIVE WASTE DISPOSAL

WEDNESDAY, OCTOBER 30, 1985

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

The committee met, pursuant to notice, at 9:35 a.m., in room SD-406, Dirksen Senate Office Building, Hon. Robert T. Stafford (chairman of the committee) presiding.

Present: Senators Stafford, Chafee, Simpson, Symms, Humphrey, Burdick, Hart, Moynihan, Mitchell, and Lautenberg.

OPENING STATEMENT OF HON. ROBERT T. STAFFORD, U.S. SENATOR FROM THE STATE OF VERMONT

Senator STAFFORD. The Committee on Environment and Public Works is meeting today to conduct an oversight hearing on the Department of Energy's program for the disposal of high level nuclear waste.

There is perhaps no greater civilian technological and institutional challenge facing this country than finding a safe and acceptable way to permanently dispose of our highly radioactive nuclear waste. We must succeed to protect the health and safety of all Americans.

High level nuclear waste has been accumulating at various sites across the country for more than 30 years. Each site poses serious hazards to surrounding communities and the environment.

The Nuclear Waste Policy Act of 1982 committed us to finding a safe and acceptable permanent geologic repository for the high level nuclear waste.

I supported this commitment in the Nuclear Waste Policy Act at the time, even though I was not successful in winning support for some amendments I felt would have provided the various States with greater influence in the process. Notwithstanding that, I continue today to support the general commitment.

The safe management and storage of high level nuclear waste and spent fuel rods is an urgent national problem that demands a solution.

Vermont is part of that solution and I know that Vermonters are willing to assume a fair share of their responsibility in the search for the solution. However, I have come to the conclusion that common sense makes it clear that it would be wrong for the Department of Energy to select any site in Vermont—or in any State with similar circumstances—for a variety of reasons. I intend to pursue those reasons at this hearing today.

Among the reasons that States like Vermont should be dropped out of the search for waste sites are these:

—Rail and highway transportation systems that are inadequate to handle the heavy and dangerous loads.

—Geographic location that would multiply the transportation hazards by requiring longer and additional trips for the nuclear wastes.

—Extreme winter weather conditions that would increase the hazards and costs of transportation and of the operation of any repository.

—Geology unsuited to the location of a waste site.

Those may sound to some like parochial arguments. They also happen to be based on fact and common sense. I remain committed to the concept that we have a national problem that demands a national solution, but that does not mean a suspension of common sense and good judgment.

The Department of Energy's program for the disposal of high level waste is at a major juncture.

The Department recently issued its mission plan. In the next several months, the Department expects to nominate and recommend sites for characterization for the first repository.

The Department expects shortly to narrow the number of sites being considered for the second repository. I hope today we will clear up whether that selection process—down to 20 sites from the current list of more than 200—is or is not on schedule.

This is an appropriate time for us to take a close look at the program, to review its status, to see where it is going and to receive comments on all of these matters.

The witnesses we will hear from include my friend and distinguished colleague, Senator Pat Leahy of Vermont, witnesses from three Federal agencies, from various States and Indian tribes, utility commissioners, utility companies, and private citizens. Among the State witnesses is Leonard Wilson, Secretary of the Vermont Agency of Environmental Conservation. I would like to extend a special welcome to Senator Leahy and to Secretary Wilson. I know their testimony will help in our search for the strengths and weaknesses of the Department of Energy program and of ways to improve that program.

I now see that the most able and distinguished chairman of our Subcommittee on Nuclear Matters, Senator Simpson, has arrived.

Senator, do you have an opening statement?

OPENING STATEMENT OF HON. ALAN K. SIMPSON, U.S. SENATOR FROM THE STATE OF WYOMING

Senator SIMPSON. Mr. Chairman, very brief. It is nice to have Senator Leahy here as we pursue this oversight hearing on the High Level Radioactive Waste Program.

I appreciate your scheduling this, and I thank you for that. It has been nearly 3 years now since Congress passed the Nuclear Waste Policy Act in the closing hours of the 97th Congress, setting in motion this comprehensive Federal policy for the storage and disposal of high level radioactive waste. A lot has happened in that time at both the State and Federal levels as interested parties and agencies involved have sought to carry the statutory requirements that are set forth in the Nuclear Waste Policy Act.

So I am looking forward to hearing the views of everyone here on what has been accomplished, how we might improve implementation of the program, and where we are headed in the next few years in our efforts to provide for a safe and permanent disposal of high level radioactive waste.

We are on the verge of two or three major decisions in this program that are going to define the course that we will take in a number of very important respects. By January 1986, DOE will be able to recommend three sites to the President for detailed site characterization. In less than a month, DOE will be narrowing down the granite States from the 17 now under consideration to approximately 4 to 6 States to be considered for the second repository. Early next year, we expect to receive DOE's views on the MRS, the Monitored Retrievable Storage Facility.

Those and other decisions that have been or will be made over the next year or so are tremendously important and will have an immediate impact on the lives of numerous people, many of whom are represented by members of this committee. So it is a pleasure to participate. The ancient litany that will be reheard here as it was during the original debate is that everybody wants to do something about high level nuclear waste, but nobody wants the stuff.

We will get to the nub of that, and that is the nub. I thank you, Mr. Chairman, and I thank your distinguished ranking minority member from Texas, Senator Bentsen. It is pleasure to participate.

Senator **Stafford**. Thank you very much, Senator Simpson.

Senator Lautenberg.

Senator **Lautenberg**. Mr. Chairman, I understand that our distinguished colleague has another hearing promptly.

Senator **Stafford**. He has a self-limiting factor in his remarks here, and that is that he is due at another committee at 10 o'clock.

Senator **Lautenberg**. I would be happy to hold my statement.

Senator **Stafford**. Thank you very much, Senator Lautenberg.

Senator Leahy, we would be very pleased to hear from you.

STATEMENT OF HON. PATRICK LEAHY, U.S. SENATOR FROM THE STATE OF VERMONT

Senator **Leahy**. Thank you, Mr. Chairman.

Before I start, I want to thank the chairman of the committee, Senator Stafford, for scheduling these hearings. I think it is well known in Vermont and in Washington that Senator Stafford has been a leader in this area, and has often pushed a reluctant Congress to grapple with and face up to the problems involved.

All Vermonters, of both parties, applaud him for that work.

As the chairman knows, the Department of Energy's Nuclear Waste Program has been very controversial in Vermont. Hundreds of Vermonters who have turned out at meetings throughout the State on the Department's plan. In fact, in many instances, meetings have had to be changed at the last minute to larger and larger halls or auditoriums just to hold the people who are concerned.

I don't think that it will be any surprise to you to learn that strong feelings were expressed at these meetings in Vermont. I think the opinions expressed at the meetings were based on more than bent feelings. Many of the speakers raised fundamental questions about the wisdom and the fairness of the present Radioactive Waste Program.

The concerns raised by those Vermonters have made it clear to me that the Nuclear Waste Policy Act has to be thoroughly reviewed by the Congress. I think there are two broad issues that should be addressed.

First, has the Department of Energy implemented the Nuclear Waste Policy Act as Congress intended; and does the Nuclear Waste Policy Act need to be fundamentally altered. I hope that both of these issues will be addressed.

I have come to the conclusion that the act needs to be fundamentally altered, and that the Department has not implemented the existing act in a manner that should be accepted by the Congress.

The Nuclear Waste Policy Act had two basic premises. The first was that the Congress must establish a program to dispose of nuclear waste quickly. This urgency existed because the lack of a demonstrated method of radioactive waste disposal threatened the viability of nuclear power in the United States.

Back at the time the act was being written, the Supreme Court was considering whether to overturn the California statute which conditioned the expansion of nuclear power on the demonstration of such a solution. I think the nuclear industry viewed the passage of the Nuclear Waste Policy Act as part of an effort to win the lawsuit to overrule the California statute.

The second premise of the legislation was that the radioactive waste problem was a political problem, and not a scientific one. Thus, it was necessary to create a system that would overcome the political obstacles through deadlines and similar mechanisms. It was assumed that acceptable geological sites could be found.

I don't agree with either of those premises. When the Congress writes nuclear waste legislation, I believe its premise should be the health and safety of the American people. I believe that the determination of whether or not a safe geological site can be found for nuclear waste is a matter that must be solved by scientific research, and not by legislative fiat. We are certainly not going to do it legislatively. Let me give three examples.

The premise that the nuclear waste disposal problem must be solved quickly has created an unsound and unfair process. The act requires that the second set of repositories be chosen by 1989. It may seem like a long time. However, when you start to realize, as the Department of Energy now does, all the work that has to be done to make that decision, it is a very short time, indeed.

The Department of Energy has already slipped the deadline twice by 2 years. I think that because of the time pressures built into the act, the Department of Energy had to choose to look at the second repository where it had already completed its initial geological survey. Its completed studies, unfortunately, had only looked at eastern granite. So in its search for new candidates for the second round of sites, it only looked at crystalline rock, and that is granite, east of the Mississippi.

In making this arbitrary decision only to look at granite east of the Mississippi, it ignored two-thirds of the granite deposits in the United States.

The time pressure to find a nuclear waste dump has created other problems as well. In section 960.3-2-1 of the regulations, it states:

> To identify a site as potentially acceptable, the evidence shall support a finding that the site is not disqualified in accordance with the application requirements set forth in appendix III of this part.

That is sort of putting it backward. It is saying that ignorance is bliss, and ignorance is not bliss. A site should be considered acceptable if the evidence shows that it is acceptable, then and only then.

I can think of a small town in our own State, Mr. Chairman, which thinks its granite has severe structural problems that make it unsafe as a dump. It would cost hundreds of thousands of dollars to prove that, perhaps millions of dollars. Some of these towns are 500 people, maybe 1,000 people. There is no way at all that they could possibly raise that money to prove that it is not acceptable, but under the Department of Energy's regulations, the town bears the burden and the cost of proving that it is not an acceptable site. I think DOE should bear that burden.

The Nuclear Waste Policy Act has been written so that environmental impact statements and probably court action are precluded until very late in the process, again making it impossible to really get involved, unless one is extraordinarily well financed with both scientific and legal backing.

Thus I am going to introduce legislation which proposes some changes in the act. Some are generic. Some speak directly to how the Department's regulations have been implemented in Vermont.

First, the Area Recommendation Report, which will narrow the candidate list this fall from over 200 to 15 or 20 sites should be subject to full and EIS process and court review.

Second, section 112(b)(2)(C) should be amended to require DOE to examine all potential disposal sites wherever they exist in the country.

Third, section 960.3-2-1 should be changed to require that sites not chosen as priority sites for round two should be eliminated from consideration for 25 years. This will free communities from the limbo created by existing regulations.

Fourth, existing regulations must be amended to place the burden of proof to develop the evidence needed to show that a site is qualified on the Department of Energy.

Then there is a fifth point, Mr. Chairman, which you alluded to in your opening statement, and that of course is the question of poor transportation facilities. Certainly that has to be considered, and whether that precludes certain sites from consideration.

The Department of Energy, because it does not understand our governmental structure in Vermont, has failed to exclude from its consideration for the second repository 34 towns in Vermont with populations of 2,500 or more. The bill corrects this error.

As we learned from our hearings in Vermont, the location of a nuclear waste dump site along our Canadian border will cause serious problems with our neighbors. A large number of Canadians have appeared at our meetings.

The legislation addresses this issue by requiring that the Department of Energy consider Canadian population density and preclude from consideration sites along the border that would require geological testing in Canada to determine their suitability.

Last, of course, it would state that a nuclear waste repository should not be located in the National Park System.

Mr. Chairman, in 1980, I held hearings on the potential impact of the Department's plan to locate a nuclear waste dump in rural areas. At that time, the Secretary of Energy said that they really had not determined what would be the impact in a rural area. Today, sadly, they still have not. I think that the Department of Energy, whether through legislation or otherwise, must spend some time looking at what it does to a rural area. The boom and bust nature of putting in a dump site, must be considered.

Mr. Chairman, I have spoken longer than I intended. I appreciate your consideration and that of the members of the committee here this morning.

Senator STAFFORD. Thank you very much, Senator Leahy. We do know that you have another commitment at 10. Let me just ask you one very brief question about Vermont and States similar to it.

My recollection is that the water table is only about 6 feet below the surface in Vermont. Am I correct in that?

Senator LEAHY. Yes, you are. In fact, our State relies significantly on ground water.

Senator STAFFORD. So that any subterranean storage of any highly toxic material would likely be placed in an area where water would be prevalent.

Senator LEAHY. That is right.

Senator STAFFORD. Thank you very much, Senator, for an excellent statement. Knowing of your commitment elsewhere, we would be glad to have you stay, but we understand that you have to leave.

Senator LEAHY. Thank you very much, Mr. Chairman.

Senator STAFFORD. Thank you.

Senator Lautenberg, you did have a statement, and now would be a good time before we reach the government witnesses.

OPENING STATEMENT OF HON. FRANK R. LAUTENBERG, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Senator LAUTENBERG. I thank you, Mr. Chairman.

I am concerned that the committee closely consider the public health and environmental impacts associated with the disposal of high level radioactive waste. The Department of Energy has missed major milestones. I am concerned that as the dates for selecting sites grow nearer, public health and environmental protection not be sacrificed in a rush to designate sites.

This is not to belittle the need to select a site. Nuclear facilities around this country have already generated substantial quantities of high level radioactive waste. This waste will have to be disposed of. But it must be deposited safely—it must not endanger surrounding communities, our ground water supplies, and precious natural resources.

Mr. Chairman, I am particularly concerned about the selection of a second site. As part of the siting process, DOE has conducted its survey of granitic areas—so-called crystalline rock areas—which are potentially suitable for the second site. Over 200 sites were identified in this survey, including sites in New Jersey.

DOE has indicated that it will narrow this list to 15 to 20 sites by November 15. While selecting a New Jersey site may only be a theoretical possibility, Mr. Chairman, I must express my deep reservations about DOE seriously considering New Jersey for such a site.

New Jersey is the most densely populated State in the Nation. The granitic bedrock in New Jersey runs through the northern part of the State, the most populous area. Extensive ground water supplies, including the unconsolidated quarternary aquifer, are located nearby.

Mr. Chairman, I recognize that DOE selected its initial list of secondary sites at arms length, by analyzing geologic data. Now, I understand the Department will be looking at other factors, which are critical to siting decisions, such as demographic data and environmental factors.

New Jersey already bears the legacy of lax Federal and commercial disposal practices. There is not a county in the State which is not marked by dangerous toxic waste sites. Further, residents of New Jersey already face elevated risks of radiation exposure due to the existence of the reading prong, an area running through northern and western New Jersey with naturally occurring radon hot spots.

I very much appreciate the committee's oversight of this program, and intend to stay involved in the process as DOE continues through the selecting process.

I agree with something our distinguished colleague from Wyoming said earlier. Everybody is pointing to the other guy's backyard to get rid of this. I wonder while just the four of us are here, could we pick a State that we want to put this in before the others get here?

Thank you, Mr. Chairman.

Senator STAFFORD. The Chair also detects a certain reluctance to have a repository in each Senator's State.

Senator Humphrey, do you have an opening statement?

Senator HUMPHREY. Not at this time, Mr. Chairman.

Senator STAFFORD. This will bring us to the first witness, Mr. Ben C. Rusche. Mr. Rusche is the Director of the Office of Civilian Radioactive Waste Management, the U.S. Department of Energy.

You already know how popular the idea of waste management is if it is going to land in somebody's State.

Mr. Rusche, for you and for the other representatives of the government, and the Nuclear Regulatory Commission, we will, without objection, place your full statement in the record. We would appreciate it, in view of the number of witnesses who will appear, if you could summarize your statement in not to exceed 10 minutes, and preferably about 7 or 8, if you can do it. I expect that there will be extensive questioning following your statement.

STATEMENT OF BEN C. RUSCHE, DIRECTOR, OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT, U.S. DEPARTMENT OF ENERGY

Mr. **Rusche**. Thank you very much, Mr. Chairman, and members of the committee.

I had not planned to say so, but I am struck by the enthusiasm that the members of the committee have for locations in other States.

Senator **Lautenberg**. Could we find out where the witness is from, Mr. Chairman?

Senator **Stafford**. We will before we get through.

Mr. **Rusche**. Senator Lautenberg, I am from South Carolina.

Senator **Lautenberg**. That sounds all right to me.

Mr. **Rusche**. I am pleased to appear before you today to discuss the DOE's mission plan for civilian radioactive waste management and the status of our program's activities.

In July of this year, and after considerable review by states, Indian tribes, Federal agencies, and other interested parties, we issued a mission plan as required by the act. It presents our best estimate at the present time of the objectives and strategies of the program, the facilities, institutional activities, management approach, and data needed to successfully meet the principal objective under the Act, to begin accepting spent fuel and high level waste for disposal in deep geologic repositories by January 1998.

Key issues that emerged during that extensive review are attached to my formal statement.

With regard to the status of the Nuclear Waste Fund, as a result of the commercial spent fuel fee, we have collected almost $2.2 billion from one-time and ongoing fees, and have earned $31.9 million in interest on those funds.

To date, we have expended more than $748 million, and we have recently repaid the appropriated debt of approximately $264.9 million. The cumulative interest paid on this debt was $8.6 million.

As of September 30, our investment portfolio was approximately $1.5 billion. The appropriation bill for 1986, which is currently before the President for signature, is approximately $521 million for this program.

On plans for defense waste, this issue has now been resolved by the President's determination in April that he finds no basis for a separate repository for defense waste. Consequently, DOE is planning to dispose of defense waste in the civilian repository.

Prior to the President's determination of April 30, 1985, my office and DOE's Office of Defense Programs began analyses to develop potential cost allocation methodologies for equitable distribution to both the taxpayers and the ratepayers. This activity is nearing completion, and the Department will issue a Federal Register notice in November, we hope, soliciting public comments on the analyses and, hopefully, providing a basis for us to submit in our normal budgetary processes the proposal and approach that we propose to use.

Sound fund management is essential in this program, perhaps to a degree greater than any Federal program. To this end, the program is audited frequently, quarterly, if I may add, not only by the

General Accounting Office, but we also retain a private public accounting firm to perform a traditional annual audit.

A detailed schedule depicting our plans for achieving the 1998 date to begin receiving waste for disposal is contained in the draft project decision schedule issued for Federal agency comments in July 1985. We are now receiving those comments, and we expect to issue the project decision schedule later this year.

The approach we have taken, which we have recently outlined in the mission plan, evolves from the following policy goals. Mr. Chairman, I reiterate these not because they are unique, but because I think they speak to the points many of the members have already spoken to this morning.

We believe that our first objective is to protect the public health and safety and the environment. We believe the program must be credible to the public by virtue of its integrity and technical excellence. The program must neither subsidize nor penalize nuclear power as an energy source. Finally, the program must be conducted in a cost effective manner, with full costs recovered.

The strategy of the program is to ensure that the activities are carried out in a vigorous manner, with potentials for system performance improvements analyzed and incorporated where possible, and if necessary, requests for new authority when and if we see the need for it, and including contingency plans which we have described in some detail in the mission plan itself.

The act authorizes a number of key activities that taken together can meet the objectives of providing for the permanent disposal of such waste. In particular, the act authorizes the development and operation of a geologic repository, the necessary transportation system for moving the waste to the repository, and a provision for Federal interim storage.

These authorities, along with other key requirements stated in the act, that is, the need to obtain congressional approval or authorization for the construction of the second repository, constitute the minimum set of activities that the program will vigorously implement.

Let me briefly relate the status.

In February 1983, in accordance with the act, we formally identified nine sites as being potentially acceptable. I think most of you know the location of those sites. Soon thereafter, we began preparation of siting guidelines as required by the act, and after a long review process, including extensive public interaction with the affected and interested parties, we issued those in final form in December 1984.

After issuance of the guidelines in December 1984, we issued draft environmental assessments on each of the nine potential sites and announced those sites that we would propose for nomination, and our tentative choices for those that we would characterize. I think this body is well aware of those sites.

We held extensive public hearings. We have received more than 20,000 comments, which in my mind is a good example of the operation of the public process that the Congress was so intent, and I think well advised, on carrying out.

We plan to finalize those assessments, and to formally nominate sites suitable for characterization, and recommend three sites to the President for site characterization around the end of this year. At the time of recommendation, we expect to make the section 114 preliminary determination.

The ranking methodology that we will use in the formal nomination and recommendation process is one of three that were described in the draft, refined and included with greater technical specificity. We have sought the National Academy of Sciences Board of Radioactive Waste Management's review of this methodology, and they have indicated that they believe it to be appropriate, and made additional recommendations that we are now considering.

These recommendations included additional external review. I had the opportunity just yesterday to speak with Dr. Frank Press, the President of the National Academy. I expect today to formally request the Academy to review our application of the methodology.

The addition of this review, combined with the more refined process, will add about 60 days to the preparation of the environmental assessments, causing them to be issued not in December, as we had previously planned, but about 60 days later.

The decision to characterize a particular site formally triggers the act's consultation and cooperation agreement between the Department and affected tribe or State. However, well in advance of any legal requirement to do so, the State of Washington initiated consultation and cooperation agreement negotiations with DOE more than a year ago as did the Yakima Indian Nation.

We have made considerable progress in reaching agreement with Washington on virtually all issues, the key issue being liability. We will continue those discussions, and we will begin formal discussions when the sites are formally designated for characterization.

From the standpoint of many of your members, while the act does not require construction of a second repository, it does require us to carry out the siting and development activities which we have heard discussed this morning. These follow the first repository by about 5 years, and our adjustments in schedule previously referred to were those adjustments to keep that phased relationship about the same.

The screening process has been completed, identifying about 235 sites in 17 States. Later this year, we had hoped by November 15, but I expect now that it will be about December 15, to identify approximately 15 to 20 from those 235. To date, no field testing has been conducted in those 17 States. Identification of these few sites for greater attention will mark the beginning of field testing, to begin to acquire scientific data beyond that which is in the literature.

We have heard much discussion about the importance of transportation, and I am sure we will have questions. I will note that we have recognized the importance of transportation as being an integral matter in our consideration, and in particular in conjunction with the act's requirement to produce our views about a Monitored Retrievable Storage Facility. We will bring to Congress in January such a proposal for an integrated system which we believe has great potential for improving and making more efficient, as well as safe, the transportation activities related to our program.

We have identified three sites in Tennessee, and we expect to have the proposal to Congress in January.

Let me just conclude by noting that the act provides, and we have tried to work effectively with States and Indian tribes, and I expect that you will hear views of various sorts this morning from those parties.

We have provided grants to all six first repository States and three affected tribes, and we are in the process of beginning to provide grants to Indian tribes, we have provided grants to many of the States, both related to the second repository,

With that, Mr. Chairman, I think I have used my time, and I will conclude my statement and am prepared to take your questions.

Thank you very much.

Senator STAFFORD. Thank you very much, Mr. Rusche.

The Chair notes that two more members of the committee have arrived since you began your statement, Senator Mitchell and Senator Chafee.

Senator Chafee, do you have an opening statement?

Senator CHAFEE. No, Mr. Chairman.

Senator STAFFORD. Senator Mitchell, do you have one?

Senator MITCHELL. No, Mr. Chairman, I do not.

Senator STAFFORD. Since the interest in this matter is high, I would suggest to my colleagues that we have a round of questions in which the members take 10 minutes, if they want that much time, and then a second round, if that becomes necessary. If that is agreeable, gentlemen, that is the way we will start.

I have a few questions to lead off with.

Mr. Rusche, the Department of Energy's siting guidelines express a preference for siting a repository away from areas with large populations. The guidelines also protect, by disqualification, areas with no population, such as national and State parks. In addition, the guidelines, as we understand it, consider various minerals, such as copper, lead, and zinc, to be worthy of protection.

What type of protection does DOE offer to people living in rural and agricultural areas? Do minerals, I might say, receive more protection than people in these areas?

Mr. RUSCHE. Mr. Chairman, the guidelines do contain provisions for considerations such as you have suggested. I think there should be no question, and I hope there is no question, both after my statement and a look at the guidelines, that the preeminent consideration that we are dealing with is protection of the health and safety of people, not of rabbits, not of minerals, but of people.

I believe that the way we, in America, have elected to determine what kinds of conditions are required to provide that protection are through the regulatory process, which is carried out by the Environmental Protection Agency, and by the Nuclear Regulatory Commission.

So any facility in which we are eventually to store waste is obligated to meet all of the safety, health, and environment requirements of those regulatory bodies. I believe that those are the guarantees that your citizens, whether rural or urban, have that would make them confident that their interests are going to be protected.

Senator STAFFORD. Thank you.

The Nuclear Waste Policy Act requires DOE to consider the cost and impact of transporting to the repository site solidified high level radioactive waste and spent fuel to be disposed of in a repository.

Why isn't transportation a screening variable, and to what extent are you considering transportation in the region to area screening methodology?

Mr. RUSCHE. Mr. Chairman, transportation is an important parameter. In our look for the second repository site, we have done, I think, what would best be described as generic transportation considerations since we have both so many sites and so many variables. Our attempt, first, is to find some sites that appear to have the geologic, hydrologic, geotechnical parameters that warrant further investigation and further investment. To that end, we have concluded that generic transportation studies are satisfactory.

There is no question that before such a site, even if possessing the properties that we are talking about, were eventually considered as a repository site, detailed transportation analyses, and that factor as a decision parameter, would be an important part of our consideration.

Senator STAFFORD. In preliminary documents supporting the proposal for the construction of a monitored retrievable storage facility in Tennessee, DOE relies heavily on transportation benefits as part of its justification for the proposal.

If transportation is a major factor in considering a storage facility, why isn't it important enough to be considered as a variable in the selection process for the second repository?

Mr. RUSCHE. It is indeed a variable when we go to select the site. We are selecting a final site for monitored retrievable storage facility, which will be in the proposal to the Congress, and that makes the kind of consideration of transportation a very much more specific consideration.

If you note, or as you will note, when the proposal reaches Congress, we made that consideration in the light of an unknown final location for a permanent repository for the first repository. For the very reasons that we cannot now make that analysis for the first repository, we cannot make it for the second repository with any degree of confidence. Therefore, we do it in a parametric basis.

Senator STAFFORD. Many areas of my State, Vermont, are inaccessible to trucks during winter due to heavy snow. Would it be desirable to site a repository in an area that was virtually inaccessible for several months each year as far as heavy trucks are concerned?

Mr. RUSCHE. This certainly would be a factor that we would have to weigh. If it turns out that the statements you made were literally true, that we couldn't get there, it would weigh heavily in our choice.

Senator STAFFORD. Experts in Vermont—I am being a little parochial here, I will confess—have expressed concern that the granite formations in the State cannot safely contain high level radioactive waste because they are too fractured and contain water that migrates. Would these not be serious concerns in site selection?

Mr. RUSCHE. They are certainly factors that need to be evaluated. One of the reasons we would elect to conduct the additional investigation would be to determine whether those factors are of such concern that they can't be used. I think that a priori one would not preclude such consideration on the basis of the data that we now have.

Senator **STAFFORD**. Thank you very much, Mr. Rusche.

Senator Simpson.

Senator **SIMPSON**. Thank you, Mr. Chairman.

I guess, we could ask a lot of questions, but there was at least one reason that we enacted the Nuclear Waste Policy Act, and that was because waste was stacking up all over the United States in pools at the utilities; spent fuel which is now being maintained at the utilities. Petitions for reracking of the spent fuel so that they could expand the capacity on site is something, I think, people are losing track of.

That is what the issue is, and I want to ask, because we can go into all of the possible reasons why a geological area is not good, or won't work, or can't work, or shouldn't work, or the people don't like it. The initial reaction of all the Governors of the States originally selected would range from nastiness to hostile, and not much down below that.

Have you taken a current look at the spent fuel storage situation at individual utilities in the United States? Could you tell us where things stand today, and what you expect by the year 1998, that is the year we set in the act requiring the DOE to begin accepting fuel for storage.

I would like to know what that is insofar as the utility's capability to store these wastes on site, and that is what is declining and it is declining in every State in the Union. Where are we in that situation?

Mr. **RUSCHE**. Senator Simpson, we conduct an annual review of industry sources, internal sources, and otherwise, to make that very assessment that you are talking about. Unfortunately, I don't have in my head the data for each individual reactor, but let me try to make some general statements, and I will be glad to furnish for the record the specific report that details that information.

Today, we have something over 11,000 tons, I believe, stored in the fuel pools around the country. We expect to have from 35,000 to 40,000 tons by about 1998, and the total program estimated amount of fuel varies by about 120,000 to 140,000 tons for the life of the reactors now envisioned.

Some of the reactors are older reactors. Some of them were built not with the expectation of being able to store fuel or discharge fuel for such long periods of time. There are reactors, if they were able to take no further steps, that would run out of storage capacity before 1998.

There are two possibilities that are envisioned by the act. One is, in the first place, the utilities are responsible for doing whatever it takes; second, if there arises a health and safety problem as a result of such a storage, and the Commission so certifies, then there is provided for Federal interim storage, which I referred to in my comments, meaning that there is a requirement that the DOE be in a position to accept such fuel on a short-term basis for temporary storage in the event of some sort of health or safety problem that arose as a result of such storage or lack of storage.

I think you put your finger on the matter that if it is not inappropriate, I would like to reiterate. We are not trying to decide whether to have a repository or not, or have a waste disposal system. We are trying to decide, and I believe the Congress decided, that the present waste disposal system is not adequate for the long-term future, namely, continued storage in fuel basins.

Therefore, the question that we all face, you, the Congress, face, and the American people face is the course that has been outlined by the act, from a health and safety standpoint, to warrant spending the money that it is going to cost to put this permanent disposal system in place.

The consequences of not putting it in place mean that we have elected, by default, to leave such material in those various fuel pools.

Senator SIMPSON. Indeed, that is the issue. You just briefly touched on the monitored retrievable storage facility. If you could just briefly tell the committee what are the Department's views on the MRS now, and in particular give us your thoughts at the present moment on the role that an MRS facility should or could play in the overall storage or waste disposal strategy?

Mr. RUSCHE. Senator Simpson, when I was asked to accept this job as the director of this program, one of the early considerations that I was led to in looking at the act was to view that very subject.

Early on, it came to my mind that the role of the MRS was clearly intended by Congress to be something other than a substitute for a repository. The Congress had clearly the opportunity to choose MRS as the long-term disposal methodology had it chosen to do so. It did not. I concluded that the right role for an MRS was part of an integrated operating system for the purpose of enhancing the effectiveness of the transportation system, the operational reliability, improving our ability to develop and meet the schedule that was laid down by the Congress. Therefore, it should be viewed as an operating facility with a finite lifetime, with a limited storage capacity, and in no way should it be viewed as a substitute for a repository.

That is the tenor of our proposal coming in January will propose.

Senator SIMPSON. I think that does jibe pretty well with congressional intent.

We have colleagues who wish to ask questions. I am going to submit several in writing, and I would like to probe whether the 1 mil per kilowatt hour fee—that is being collected, is it not?

Mr. RUSCHE. It is indeed.

Senator SIMPSON. It is being collected, and money is flowing in there. About how much is in there?

Mr. RUSCHE. As I indicated earlier, we have collected about $2.3 billion from the one time fee and the annual fees. The annual collection rate, I think this year, will be about $375 to $400 million.

Senator SIMPSON. So you are going forward with that. Do you think that this will be sufficient to do your work?

Mr. RUSCHE. The MRS proposal will come to the Congress in January. It will show that at least through the midnineties the fee as far as we can see will be adequate.

Senator SIMPSON. I will submit my other questions in writing. I appreciate it very much, Mr. Chairman.

Senator STAFFORD. Thank you, Senator Simpson.

Mr. Rusche, if there is $2 billion plus in the fund at the present time, has the Treasury Department threatened to borrow it to keep us from defaulting?

Mr. RUSCHE. No, sir. I hope that we are immune to that in that the fund is separate from the general fund. We do have about $1.4 billion invested as the act provides that we do.

Senator STAFFORD. Thank you. Senator Lautenberg.

Senator LAUTENBERG. Thank you, Mr. Chairman.

Mr. Rusche, the first site is statutorily limited to 70,000 metric tons. Is that correct?

Mr. RUSCHE. Yes, sir.

Senator LAUTENBERG. You said that there was presently in temporary storage facilities, if they can be called that, 11,000.

Mr. RUSCHE. I think that is about right.

Senator LAUTENBERG. What is your estimate of the capacity needed for currently operating nuclear powerplants?

You included DOD storage in some of your estimates, is that right, or suggested that they would be depositing along with the civilian waste.

Mr. RUSCHE. Yes, the defense waste will be stored in the civilian repository, and they are not included in the 120,000 to 130,000 tons, that is the fuel from civilian plants.

Senator LAUTENBERG. By the time we reach the first site availability, what is the estimate for what is going to be required?

Mr. RUSCHE. The actual amount of spent fuel and nuclear waste in existence at the time the first repository comes into operation probably is on the order, in equivalent terms of 40,000 to 50,000 metric tons. I would have to guess, since I don't have the number right before me, if no further reactors were brought on line, what would be the generation from the current existing reactors.

I believe there are now, if there are no new orders, and the plants come on line as we now envision, we indicated that there will be about 84,000.

Senator LAUTENBERG. That is from the commercial sites.

Mr. RUSCHE. Yes.

Senator LAUTENBERG. DOD adds, and I guess that it all comes from more than one place.

Mr. RUSCHE. It is generated by DOD in its defense operations. Depending on how you measure that waste, it varies from about 10 to 30 percent of the amount being measured either by heat or by volume, or by a number of factors, so somewhere between 10 and 30 percent of the civilian.

Senator LAUTENBERG. So the prospect for that first site repository is not very longterm.

Mr. RUSCHE. The first repository, given the limitation in the act of 70,000 tons, will not meet the needs of the projected generation of spent fuel and nuclear waste in the country.

Senator LAUTENBERG. That is the time that it is available, right? By then we will already be beyond the capacity of the first site.

Mr. RUSCHE. Literally, in 1998, when the repository begins operation, if we had immediately 70,000 tons of capacity in that repository, that capacity would exceed the amount of material then existing. But for the reactors operating, the 70,000 tons would not be adequate.

Senator LAUTENBERG. How would you prioritize who gets to put their material there? Is there a process that is used for selection?

Mr. RUSCHE. Yes, there is a provision in the contract that we have with the utilities which deals with the priority for utility fuel first. It generally goes to the simple provision that you take the oldest fuel first because that is most appropriate for insertion in the repository from the standpoint of heat load.

With respect to the priority between civilian and defense, the provisions that are now being made in the defense system for solidification of that material, that is for vitrifying it, provide for sufficient storage on site for several years beyond the 1998 date.

So when we begin operation of the repository in 1998 as now scheduled, we will not likely immediately begin inserting defense material. We will be inserting altogether civilian material. Perhaps in the first 4, 5, or 6 years thereafter, the sequencing will begin mixing both.

Senator LAUTENBERG. You say that the age of the material is deciding factor.

Mr. RUSCHE. It is the first approach.

Senator LAUTENBERG. Regardless of distance from the repository site.

Mr. RUSCHE. I think that the utilities are going to have to look carefully. There are some, as you have heard me say to Senator Simpson, that may have greater urgency, that is, their storage capacity may be approaching much more rapidly than others.

Senator LAUTENBERG. The message is, don't build a lot of storage capacity, then you get to put it in Federal facilities.

Mr. RUSCHE. I would not say that, sir. It is a factor that the utilities individually have to weigh. We have committed to work with the utilities in working out the most equitable, safe, and efficient receipt schedule. We have extensive discussions underway now, and we will continue those as we approach the time when we can receive the material.

Senator LAUTENBERG. You limit your crystalline rock survey to the East, as I see it. The act doesn't require you to identify that material in the East primarily. Why has it fallen that way?

Mr. RUSCHE. I think that there are two reasons. The act does suggest that an important consideration in meeting the needs of the program is to look at geographic diversity, that is, that we not put everything somewhere. For example, everything in New Jersey would not be well received. Everything in Vermont would not be well received. Likewise, everything in Nevada or Washington.

The first set of sites which we are considering came out of a research and investigation program that had been underway for some time, and in general those sites are located in the Western part of the United States and the South. None of those rocks or none of those considerations are in crystalline rock.

There is certainly much data available to attest to the suitability of crystalline rock. So by turning our attention to crystalline rock in the East, Northeast and upper-Midwest, we addressed both of the objectives of geographic diversity and diversity in rock type.

Senator **Lautenberg**. Is crystalline rock, in your judgment, the only kind of structural composition that would accept this? What about the salt areas?

Mr. **Rusche**. We are looking at salt in the first repository set. The nine sites that we are looking at for the first repository, two are in volcanic rock and seven of them are in salt.

Senator **Lautenberg**. Briefly, what about the transportation problems. What is the transportation system availability? Is it only by truck?

Mr. **Rusche**. Truck and rail are the primary considerations.

Senator **Lautenberg**. What about barge?

Mr. **Rusche**. We have looked at barge. Although I wouldn't rule it out as an absolute no, there does not appear to be many advantages that would lead us to barging.

Senator **Lautenberg**. Thank you, Mr. Chairman. I have other questions that I would like to submit in writing.

Senator **Stafford**. Thank you very much, Senator Lautenberg.

I might say, for the record here, that I have some additional questions, too, but in view of the numbers of witnesses and time involved, I will submit them in writing.

The Chair would remind his colleagues that we are proceeding in accordance with an agreement in the last two Congresses and in this one that we would recognize members for questions in order in which they appear.

Senator Mitchell, I believe you were next.

Senator **Mitchell**. Thank you very much, Mr. Chairman.

Mr. Rusche, you gave a series of figures regarding estimates of total waste at various times. I didn't quite understand. At one point you said, or I thought you said, 40,000 to 50,000 tons would be the amount that would be in existence at the time the first repository was opened, and then you said, 84,000 tons.

Could you tell me now what, in your present estimate, will be the amount that will be in existence in 1998 when the first repository is scheduled to be opened?

Mr. **Rusche**. About 40,000 to 50,000 tons.

Senator **Mitchell**. What is the 84,000 tons figure?

Mr. **Rusche**. That was a number that I related in response to what would be the waste generated from the reactors now in existence, many of which reactors will continue to operate beyond 1998.

Senator **Mitchell**. That is through their useful life.

Mr. **Rusche**. Yes.

Senator **Mitchell**. The act limits the first repository to 70,000 metric tons, but does not require the construction of a second repository. That is correct, is it not?

Mr. **Rusche**. That is correct.

Senator **Mitchell**. It requires that such a second site be nominated and characterized, but not constructed.

Mr. **Rusche**. Correct.

Senator **Mitchell**. Based upon the information you have provided here today, I gather that it is your expectation that if the 70,000 metric ton limit is adhered to, there will have to be a second repository constructed. Is that your current estimate?

Mr. RUSCHE. If the 70,000 metric ton limit is adhered to for the first repository, it is our view that a second repository will be required.

Senator MITCHELL. I would ask if you would provide me with the specific data upon which you have made the estimates of future needs which you stated here today, and any others which you have.

Mr. RUSCHE. Certainly, these are based on EIA analyses in many cases, and we will be glad to provide those to you, for the record.

Senator MITCHELL. I would appreciate that very much.

[The information requested by Senator Mitchell follows:]

Attached is a copy of the EIA report on "Commercial Nuclear Power 1984, Prospects for the United States and the World," published in November 1984. Please look particularly at Appendix H: "Annual Projections of Nuclear Capacity, Generation, and Spent Fuel Discharges, 1984-2020." on page 115.

[The following has been excerpted from the above-named report:]

Commercial Nuclear Power 1984

Prospects for the United States and the World

Published:
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This report was prepared by the Energy Information Administration, the independent statistical and analytical agency within the Department of Energy. The information contained herein should not be construed as advocating or necessarily reflecting any policy position of the Department of Energy or any other organization.

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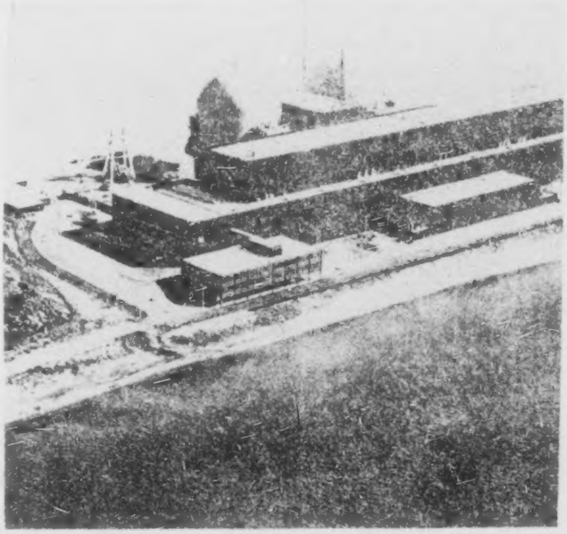

Executive Summary

This report presents historical data on commercial nuclear power in the United States, projections of domestic nuclear capacity and generation through the year 2020, and country-specific projections of nuclear capacity through the year 2000 for countries in the world outside centrally planned economic areas (WOCA).

U.S. Commercial Nuclear Power

Current Status, December 31, 1983

At the end of 1983, 80 nuclear reactors were operating in the United States, totaling 64.4 gigawatts of electrical generating capacity (GWe).[1] These reactors generated a record amount of 293.7 net terawatthours (TWh) of electricity, or 12.7 percent of total U.S. electricity generation. Three additional nuclear reactors, totaling 3.4 GWe, had been loaded with fuel and were undergoing low-power testing at yearend. The overall average capacity factor for nuclear units during 1983 was 54.8 percent, a decrease from the previous year and the lowest level since the Three Mile Island accident in 1979. Also during the year, 6 nuclear units that had been on order or in early stages of construction, totaling 6.0 GWe, were cancelled.

Projections for the Intermediate Term, Through 1995

The intermediate-term projections are based on a reactor "pipeline" analysis, which entails a reactor-by-reactor review of units that are under construction or in the licensing process. The middle- and high-case nuclear supply scenarios assume that the amount of nuclear capacity online in 1995 (and 2000) will be determined by the completion of all units currently in the licensing and construction pipeline (i.e., that potential cancellations will be offset by, for example, the reactivation of mothballed units, and that any additional reactors ordered during the projection period will not be operable until after the year 2000). The low-case nuclear supply scenario also assumes that plants resulting from new orders will not become operable until after 2000 and, in addition, that a number of units currently in the construction pipeline will be cancelled.

Projections for all the cases show a rapid increase in operable nuclear capacity and generation through the late 1980's, followed by a slowdown through the remainder of the intermediate term. The middle-case projection is for 84.8 GWe of operable nuclear capacity in 1985, 110.8 GWe in 1990, and 119.2 GWe in 1995. The low- and high-case nuclear scenarios reflect varying rates of completion for the units included in each, which in turn reflect a range of possible futures for regulatory and financial constraints and electricity demand growth. Projections for the low and high cases are for 109 GWe and 123 GWe, respectively, of operable nuclear capacity in 1995.

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[1] In the 1983 version of this report, Commercial Nuclear Power: Prospects for the United States and the World, DOE/EIA-0438 (Washington, D.C., November 1983), nuclear capacity status and projections were based on nuclear units' achievement of commercial operation status. In this report, the status and projections are based on the achievement of "operable status" -- i.e., completion of low-power testing and receipt of authorization for full-power operations. All capacity values are based on net design electrical ratings (DER), as defined in the Glossary.

Projections for the Long Term, Through 2020

Projections for the period from 1995 through 2000 are based on a continuation of the reactor pipeline analysis, since it is assumed that no newly ordered plants are likely to become operable through 2000. In the middle case, based on completion date assumptions, it is projected that three units remaining in the construction pipeline, totaling 3.8 GWe are added and three units comprising 1.1 GWe are retired by 2000, thus bringing the projected total capacity to 122 GWe. In the low and high cases, no additional capacity is added in the 1995-2000 period, since the three units projected to become operable in the middle case are assumed to be cancelled in the low case, and in the high case they are assumed to be operable before 1995. The projections in the low and high cases are for 108 GWe and 123 GWe, respectively, of operable nuclear capacity in the year 2000.

During the period from 2000 through 2020, replacement for reactor retirements and potential demand for additional nuclear power are assumed to be satisfied by new orders for light-water reactors. Any projection for a period 15 to 40 years into the future is fraught with uncertainty, and in particular there are numerous factors, many as yet unforeseen, that are likely to affect the commercial nuclear power program during this period. Considering such uncertainty, the EIA's long-term projections for the low-, middle-, and high-case scenarios assume that U.S. utilities will maintain a diversified baseload electricity supply by continuing to rely on coal and nuclear fuels in order to reduce consumption of relatively high-cost oil and gas supplies, and to meet demand growth until new generating technologies become available.

The projections of operable nuclear capacity for the year 2000 are used as a point of departure for long-term projections through 2020. Long-term projections are derived using the World Integrated Nuclear Evaluation System (WINES), a long-run aggregated, demand-driven model that derives nuclear generation requirements (and installed capacity) as a share of electrical generation, which is, in turn, derived as a share of delivered energy. The projections of 108, 122, and 123 GWe of nuclear capacity by 2000 in the low, middle, and high cases, respectively, are shown to increase at average annual rates of 1.4, 2.8, and 5.2 percent per year through 2020, resulting in capacity projections of 143, 212, and 341 GWe, respectively, in 2020. A no new orders case, which uses the year 2000 low-case projection as a point of departure is also presented. The no new orders case projection of 48.8 GWe in 2020 results from assumptions regarding reactor retirement schedules.

The middle-case projection of 212 GWe assumes modest average annual growth rates for the gross national product (GNP) and for energy demand of 2.0 and 0.8 percent, respectively. The electricity share of delivered energy is projected to increase to about 29 percent, by 2020. The nuclear share of electricity supply for the middle case is projected to increase to 22 percent in 2020, compared with the intermediate-term projection of 19 percent in 1995. It is assumed that ordering of new nuclear plants will resume in sufficient time for the resulting capacity to become operable between the year 2000 and 2005.

Appendix H

Annual Projections of Nuclear Capacity, Generation, and Spent Fuel Discharges, 1984-2020

The projections contained in this appendix were developed in accordance with the assumptions detailed in Chapter 2 of this report. Table H1 provides the annual detail supporting the capacity projections for each nuclear power supply scenario shown in Tables 5 and 8. Table H2 presents annual gross generation projections for each nuclear power supply scenario.[1] Table H3 provides annual projections of spent fuel discharges assuming, in one case, constant fuel burnup and, in another, increasing fuel burnup, for each of the nuclear power supply scenarios; Table H4 provides the associated cumulative totals.

The post-2000 capacity projections are based on a linear interpolation of nuclear capacity requirements estimated at 5-year intervals beginning in 2005. These projections should, therefore, be regarded as annual averages.

Spent fuel discharge projections were developed using two nuclear fuel burnup level assumptions. In one spent fuel discharge scenario, an average annual 2.5 percent arithmetic increase in the average operational equilibrium cycle burnup level is assumed, starting in 1985 and continuing through 1996. The 1996 burnup levels, 30 percent above the pre-1985 levels, are then assumed to remain constant through 2020. This average increase in burnup levels is assumed to result in a decrease in spent fuel discharges for each reactor that has achieved equilibrium operation. (Spent fuel discharge rates for reactors in pre-equilibrium operation are assumed to be unaffected by changes in average burnup levels.) The decrease in spent fuel discharges relative to the constant burnup scenario is represented by:

$$R = 1/(1 + 0.025k) \quad \text{for } 0 \leq k \leq 12 \quad ,$$

where: k = forecast year - 1984. Thus, for example, for 1996, $k = 12$ and $R = 0.769$.

Beginning in 1996, therefore, the projected annual spent fuel discharge values in the increasing burnup scenario are, at most, about 23 percent less than the values projected in the constant burnup scenario. For any given year, the projected annual spent fuel discharges in the two burnup scenarios may differ by less than the respective R value, since the pre-equilibrium and final-core discharges are not affected by the extended burnup assumption.

The alternate spent fuel discharge scenario assumes no increase in burnup beyond the yearend 1982 average equilibrium cycle operational burnup levels of about 30,000 megawatt-days thermal per metric ton of uranium (MWDt/MTU) for domestic pressurized-water reactors (PRW's) and about 24,000 MWDt/MTU for domestic boiling-water reactors (BWR's). Complete documentation of the methodology for projecting spent fuel discharges is included in the forthcoming EIA report, World Nuclear Fuel Cycle Requirements 1984, DOE/EIA-0436(84) (Washington, D.C., November 1984).

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[1] The values in this appendix are presented in terms of calendar years. The U.S. Department of Energy Office of Civilian Radioactive Waste Management, for its purposes, converts the generation projections to fiscal years.

Table H1. U.S. Nuclear Capacity Projections (Net GWe)[a]

	Scenario			
Year	No New Orders	Low	Middle	High
1983[b] ..	64	64	64	64
1984 ...	69	69	74	77
1985 ...	81	81	85	93
1986 ...	88	88	94	104
1987 ...	96	98	104	105
1988 ...	104	104	105	108
1989 ...	106	106	107	112
1990 ...	107	107	111	114
1991 ...	108	108	113	119
1992 ...	108	108	117	119
1993 ...	109	109	119	119
1994 ...	109	109	119	120
1995 ...	109	109	119	123
1996 ...	109	109	122	123
1997 ...	109	109	123	123
1998 ...	109	109	123	123
1999 ...	109	109	123	123
2000 ...	108	108	123	123
2001 ...	108	111	127	133
2002 ...	108	113	132	143
2003 ...	108	116	138	153
2004 ...	108	118	143	163
2005 ...	108	121	148	173
2006 ...	108	122	152	182
2007 ...	108	123	155	191
2008 ...	108	124	159	200
2009 ...	108	125	162	209
2010 ...	106	126	166	220
2011 ...	105	128	171	232
2012 ...	99	130	175	243
2013 ...	91	132	180	255
2014 ...	74	133	184	267
2015 ...	68	135	189	279
2016 ...	60	137	194	291
2017 ...	56	139	198	303
2018 ...	53	140	203	315
2019 ...	49	142	207	328
2020 ...	49	143	212	341

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[a] All projections include the 850-MWe Hanford-N reactor.

[b] Actual.

Sources: Energy Information Administration, Annual Energy Outlook 1983, DOE/EIA-0383(83) (Washington, D.C., May 1984), and the WINES model.

Table H2. U.S. Nuclear Generation Projections (Gross Terawatthours)[a]

	Scenario			
Year	No New Orders	Low	Middle	High
1983[b] ..	314	314	314	314
1984 ...	322	322	334	345
1985 ...	373	373	404	421
1986 ...	416	416	455	478
1987 ...	480	480	519	530
1988 ...	534	534	559	566
1989 ...	567	567	588	609
1990 ...	585	585	610	628
1991 ...	596	596	623	644
1992 ...	601	601	646	659
1993 ...	616	616	658	673
1994 ...	620	620	671	679
1995 ...	630	630	675	701
1996 ...	631	631	692	707
1997 ...	641	641	712	719
1998 ...	651	650	726	733
1999 ...	651	650	730	734
2000 ...	651	650	732	734
2001 ...	647	656	751	771
2002 ...	647	668	773	814
2003 ...	646	680	800	865
2004 ...	646	696	827	925
2005 ...	646	709	860	983
2006 ...	646	716	883	1,038
2007 ...	646	716	898	1,087
2008 ...	646	711	909	1,132
2009 ...	644	689	904	1,160
2010 ...	633	701	927	1,218
2011 ...	630	720	959	1,294
2012 ...	594	742	1,003	1,374
2013 ...	544	759	1,036	1,449
2014 ...	440	773	1,066	1,523
2015 ...	406	790	1,099	1,599
2016 ...	360	806	1,134	1,680
2017 ...	337	817	1,161	1,758
2018 ...	317	832	1,193	1,831
2019 ...	291	841	1,220	1,907
2020 ...	291	851	1,246	1,981

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[a] All projections include the 850-MWe Hanford-N reactor, which is assumed to generate 3.5 TWh annually until its retirement (see Assumptions, Chapter 2). Gross generation is estimated as 1.05 x net generation.

[b] Actual.

Sources: Energy Information Administration, Annual Energy Outlook 1983, DOE/EIA-0383(83) (Washington, D.C., May 1984); Nucleonics Week, January 26, 1984 (New York, McGraw-Hill); and NUFUEL model, version 3 (1977).

Table H3. U.S. Annual Spent Fuel Discharge Projections[a] (Thousand Metric Tons of Heavy Metal)

	Scenario							
	Constant Fuel Burnup Levels				Increasing Fuel Burnup Levels			
Year	No New Orders	Low	Middle	High	No New Orders	Low	Middle	High
1983[b] ...	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
1984	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1
1985	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2
1986	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.4
1987	1.6	1.6	1.7	1.8	1.4	1.4	1.5	1.6
1988	1.8	1.8	2.0	2.1	1.7	1.7	1.8	1.9
1989	2.0	2.0	2.1	2.3	1.8	1.8	1.9	2.1
1990	2.2	2.2	2.3	2.4	2.0	2.0	2.1	2.2
1991	2.3	2.3	2.3	2.4	2.1	2.0	2.0	2.1
1992	2.4	2.4	2.5	2.6	2.1	2.1	2.1	2.2
1993	2.4	2.5	2.6	2.6	2.0	2.0	2.1	2.2
1994	2.5	2.5	2.6	2.7	2.0	2.0	2.1	2.2
1995	2.5	2.5	2.7	2.8	2.0	2.0	2.2	2.2
1996	2.5	2.5	2.7	2.8	2.0	1.9	2.2	2.2
1997	2.6	2.7	2.8	2.9	2.0	2.1	2.2	2.3
1998	2.6	2.7	2.9	3.0	2.0	2.1	2.3	2.3
1999	2.6	2.6	3.0	3.0	2.0	2.0	2.4	2.4
2000	2.6	2.7	3.0	3.0	2.0	2.1	2.4	2.3
2001	2.6	2.6	3.0	3.0	2.0	2.0	2.3	2.3
2002	2.7	2.8	3.0	3.1	2.1	2.2	2.3	2.4
2003	2.6	2.7	3.1	3.2	2.0	2.1	2.5	2.5
2004	2.6	2.9	3.3	3.5	2.0	2.3	2.6	2.8
2005	2.7	2.9	3.4	3.7	2.1	2.3	2.8	3.1
2006	2.7	3.2	3.8	4.2	2.1	2.6	3.1	3.6
2007	2.8	3.6	4.1	4.6	2.1	3.0	3.4	4.0
2008	2.7	4.0	4.7	5.4	2.1	3.5	4.1	4.7
2009	2.7	3.7	4.5	5.3	2.1	3.3	3.9	4.7
2010	2.8	3.6	4.5	5.5	2.2	3.2	3.9	4.8
2011	3.0	3.1	4.0	5.1	2.4	2.7	3.4	4.4
2012	3.3	3.3	4.1	5.4	2.7	2.9	3.6	4.7
2013	3.6	3.2	4.2	5.6	3.1	2.8	3.6	4.8
2014	3.2	3.1	4.2	5.8	2.8	2.7	3.6	4.9
2015	2.8	3.1	4.3	6.1	2.5	2.6	3.6	5.1
2016	2.1	3.1	4.3	6.2	1.8	2.5	3.5	5.2
2017	2.0	3.3	4.5	6.6	1.7	2.6	3.6	5.4
2018	1.6	3.3	4.7	7.0	1.3	2.7	3.8	5.7
2019	1.5	3.3	4.7	7.2	1.2	2.6	3.8	5.8
2020	1.3	3.4	4.9	7.6	1.0	2.7	3.9	6.1

[a] All projections exclude the Hanford-N reactor. Projected values have been smoothed using a 3-year moving average technique.

[b] Actual.

Sources: 1983 data from U.S. Department of Energy, Assistant Secretary for Nuclear Energy, "Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics," DOE/NE-0017/3, Draft (Washington, D.C., June 1984); projections derived from the NUFUEL model, version 3 (1977).

Table H4. U.S. Cumulative Spent Fuel Discharge Projections[a] (Thousand Metric Tons of Heavy Metal)

	Scenario							
	Constant Fuel Burnup Levels				Increasing Fuel Burnup Levels			
Year	No New Orders	Low	Middle	High	No New Orders	Low	Middle	High
1983[b] ...	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
1984	11.1	11.1	11.1	11.1	11.0	11.0	11.0	11.0
1985	12.4	12.4	12.4	12.4	12.2	12.2	12.2	12.2
1986	13.8	13.8	13.8	13.8	13.5	13.5	13.5	13.6
1987	15.4	15.4	15.5	15.6	14.9	14.9	15.0	15.2
1988	17.2	17.2	17.5	17.7	16.6	16.6	16.8	17.1
1989	19.2	19.2	19.6	20.0	18.4	18.4	18.7	19.2
1990	21.4	21.4	21.9	22.4	20.4	20.4	20.8	21.4
1991	23.7	23.7	24.2	24.8	22.5	22.4	22.8	23.5
1992	26.1	26.1	26.7	27.4	24.6	24.5	24.9	25.7
1993	28.5	28.6	29.3	30.0	26.6	26.5	27.0	27.9
1994	31.0	31.1	31.9	32.7	28.6	28.5	29.1	30.1
1995	33.5	33.6	34.6	35.5	30.6	30.5	31.3	32.3
1996	36.0	36.1	37.3	38.3	32.6	32.4	33.5	34.5
1997	38.6	38.8	40.1	41.2	34.6	34.5	35.7	36.8
1998	41.2	41.5	43.0	44.2	36.6	36.6	38.0	39.1
1999	43.8	44.1	46.0	47.2	38.6	38.6	40.4	41.5
2000	46.4	46.8	49.0	50.2	40.6	40.7	42.8	43.8
2001	49.0	49.4	52.0	53.2	42.6	42.7	45.1	46.1
2002	51.7	52.2	55.0	56.3	44.7	44.9	47.4	48.5
2003	54.3	54.9	58.1	59.5	46.7	47.0	49.9	51.0
2004	56.9	57.8	61.4	63.0	48.7	49.3	52.5	53.8
2005	59.6	60.7	64.8	66.7	50.8	51.6	55.3	56.9
2006	62.3	63.9	68.6	70.9	52.9	54.2	58.4	60.5
2007	65.1	67.5	72.7	75.5	55.0	57.2	61.8	64.5
2008	67.8	71.5	77.4	80.9	57.1	60.7	65.9	69.2
2009	70.5	75.2	81.9	86.2	59.2	64.0	69.8	73.9
2010	73.3	78.8	86.4	91.7	61.4	67.2	73.7	78.7
2011	76.3	81.9	90.4	96.8	63.8	69.9	77.1	83.1
2012	79.6	85.2	94.5	102.4	66.5	72.8	80.7	87.8
2013	83.2	88.4	98.7	108.0	69.6	75.6	84.3	92.6
2014	86.4	91.5	102.9	113.8	72.4	78.3	87.9	97.5
2015	89.2	94.6	107.2	119.9	74.9	80.9	91.5	102.6
2016	91.3	97.7	111.5	126.1	76.7	83.4	95.0	107.8
2017	93.3	101.0	116.0	132.7	78.4	86.0	98.6	113.2
2018	94.9	104.3	120.7	139.7	79.7	88.7	102.4	118.9
2019	96.4	107.6	125.4	146.9	80.9	91.3	106.2	124.7
2020	97.7	111.0	130.3	154.5	81.9	94.0	110.1	130.8

[a] All projections exclude the Hanford-N reactor.

[b] Actual. For the derivation of this value, see the forthcoming EIA report, World Nuclear Fuel Cycle Requirements 1984, DOE/EIA-0436(84) (Washington, D.C., 1984).

Source: See Table H3.

Senator MITCHELL. I would ask you whether the 70,000 metric ton limit represents an engineering limitation, that is, is there a specific level above which one cannot go in depositing such waste in a repository, or is that based on some other factor, if you know?

Mr. RUSCHE. There are two elements to the answer. One is, there are some repository sites that we are now considering for which the capacity is about 70,000 tons, or maybe a little bit more. We won't really know until we investigate the site in depth.

Most of the sites are not limited in capacity to 70,000 tons. Most of them would have capacity greater than 140,000 tons from an engineering standpoint. Again, that is somewhat subject to the investigation yet to come.

Senator MITCHELL. Presumably, when you go through the process and select the first site, you are making a judgment that, considering all of the factors that the law requires you to consider, this is the best site in the country to deposit such waste. Is that correct?

Mr. RUSCHE. No.

Senator MITCHELL. What is?

Mr. RUSCHE. We have not looked at all the sites in the country. We have looked at a selection of sites which appear to offer the high potential of meeting the regulatory requirements of health, safety, and environment.

I would like to be very careful that I don't give you the impression that there may not be a site somewhere that is slightly better, or somewhat better. The objective, as I read the act, and I believe from a practical standpoint, is to find a site that meets the regulatory requirements for meeting the health, safety, or protecting the health, safety and the environment.

Senator MITCHELL. If I may amend to say then, of those sites that have come to your attention and which you have investigated, this is the best site.

Mr. RUSCHE. Yes, sir. That is a very different statement.

Senator MITCHELL. Let me put it this way. If somebody presented to you information indicating that a site was superior to the sites that you were considering, you would consider it; would you not?

Mr. RUSCHE. I would certainly consider it.

Senator MITCHELL. Then you haven't turned away from considering sites that you think may be better than those you are looking at, have you?

Mr. RUSCHE. No, but if all of them met the regulatory requirements, then we would have to make a judgment, and you would have to make a judgment with us as to whether it is worth the additional time and resources to achieve that incremental improvement. That is a perennial consideration that we have to deal with in the real world.

Senator MITCHELL. I understand that. What I am getting at is that you are going to develop a site that will presumably be the best one that you have looked at, that has been brought to your attention, under the standards set forth in the law.

Mr. RUSCHE. Correct.

Senator MITCHELL. I am trying to get at how the decision will be made as to whether or not a second site will be needed. I gather that it will be based solely upon the quantity available, and the

70,000-ton limit, therefore, will mandate the construction of a second site.

Mr. RUSCHE. As the act is now written, a second site is by inference mandated, but not authorized.

Senator MITCHELL. If it turns out that the first site that you select has a capacity greater than 70,000 tons, and it presumably is the site which is the best one under the conditions we have suggested here; would it not make sense to review the underlying rationale of the law which imposes a 70,000-ton limit to see whether or not it might make sense, at that point, to use that for a quantity larger than the 70,000 tons?

Mr. RUSCHE. I would think that at the time we brought a recommendation to Congress for second repository, for authorization to proceed, the Congress would want to consider what options were available, and that certainly would be one of the options I think Congress would want to consider. In either case, congressional action would be required.

Senator MITCHELL. I understand that.

Mr. RUSCHE. It certainly seems to me like an option that would be a reasonable one to consider.

Senator MITCHELL. As I understand it, you have just said here that you are going to slip on the dates a little bit. Most of the deadlines in the law have not been met, and yet you express some confidence about meeting the ultimate deadline. Does that strike you as inconsistent, that is, you have a series of interim dates, which you are supposed to meet. You haven't met them, and yet to indicate to us that you expect to meet the ultimate date.

The most reliable predicter of future human behavior is past human behavior; is it not?

Mr. RUSCHE. It depends on what you are comparing it to, sir. If you are comparing it to guidelines or milestones that were set in the absence of very reliable information, then it may not be a very good predicter. I think that that is part of the question that we are dealing with.

Furthermore, I think that we, in DOE, and perhaps the Congress, did not have a very valid basis. It was not a matter of oversight or error. It was just a matter that we were all working in some very new Federal/State relationships, and these early years are very determinative years. We are making many choices that set the long term course of the program.

I have, and I think with the awareness of the Congress, and I trust with the support of Congress, chosen to take some times longer than were originally set in those initial scheduled deadlines in order that we can do our very best to assure the quality of the background, the quality of the basis for these decisions and thereby permit us to take those later courses in a more expeditious fashion. So I still feel confident about the 1998 date.

Senator MITCHELL. May I ask one more question, Mr. Chairman?

Senator STAFFORD. Certainly, but I would point out that we are almost at second bells on a rollcall vote. So one more, Senator, and that will be your 10 minutes anyway.

Senator MITCHELL. Thank you.

Mr. Rusche, did you say earlier that the mid-November date that was originally intended for the narrowing of the 236 possible formations in the secondary down to 15 or 20 would now be mid-December?

Mr. RUSCHE. Yes, sir.

Senator MITCHELL. That is your present schedule.

Mr. RUSCHE. Yes, and I feel pretty confident of that date.

Senator MITCHELL. Thank you.

Thank you, Mr. Chairman.

Senator STAFFORD. Senator Humphrey, do you want to withhold until we get back, or start now?

Senator HUMPHREY. No, I would like to start now.

Senator STAFFORD. All right.

Senator HUMPHREY. Mr. Rusche, under the siting guidelines, national forest lands are not disqualified. On the other hand, national parklands and lands "comparably significant" are disqualified. I want to focus on that phrase, "comparably significant."

In my State, as you know, we boast the White Mountain National Forest. It is not just a place that has been set aside and forgotten because of its location in the northeast, with relatively easy access to large population centers. It is very heavily used, perhaps the most heavily used national forest in the Nation, but I am not sure about that, bearing a visitor load, if you will, of 3 million visitor days per year.

Would you see that a national forest used as heavily as many national parks, I would think, as comparably significant to national parklands which are disqualified?

Mr. RUSCHE. I certainly can see that they are very important. When you say, "comparably significant," I suspect that you are looking for me to make a judgment that they are equally significant and, therefore, should not be considered.

Senator HUMPHREY. That would be acceptable.

Mr. RUSCHE. We have the more specific consideration with the national park because of the statutory basis that they exist under. We certainly would not overlook the importance of the national forests, and we have attempted to give them consideration, but not in that same specific sense.

Senator HUMPHREY. I didn't exactly expect you to issue an exemption at this juncture. I would have accepted that, but I wanted to sensitize you to a particularly special situation.

Mr. RUSCHE. I appreciate your interest, sir, and we are not unaware of it. We certainly want to give it attention, and I can assure you we will.

Senator HUMPHREY. Another one of the potential sites identified which lies within the State of New Hampshire encompasses a substantial portion of the largest lake in our State. Can you tell me how you would propose to build the necessary surface structures on the top of the lake?

Mr. RUSCHE. The lake that you are referring to occupies only a very small portion of the particular rock body that is identified, and our investigations will not involve the lake. If we found that that particular rock body appeared to have the right technical properties, it would not be a very unusual circumstance at all to find that the vertical entries to the rock body would be made at some point away from the lake, with mining underground under the lake.

If you look now at the Great Lakes, there are salt mines under the Great Lakes. In almost every country in the world, there are mining operations that are conducted under large bodies of water.

We certainly would not go down through the middle of the lake for the vertical entry. From an engineering standpoint, it would not be a matter of particular concern.

Senator **Humphrey**. I am sorry to hear that.

What about the consideration or the concern over earthquakes. We are not exactly the San Andrea's Fault in New Hampshire, but I have personally, in our brick house back home, which is fairly rigid, been scared out of my wits a few times in the night by dishes rattling, and so on.

Mr. **Rusche**. Seismic activity is certainly a factor that needs to be considered. In fact, all of the sites that we are looking at, I think, certainly the sites in the west have somewhat of a geologic history that requires careful investigation. This would be equally true in the crystalline rock such as you are talking about. There are fairly well accepted geologic tests and data that one can gain as to whether or not the rock bodies are in active faulting or subject to what is likely to be earthquake activity of concern. If we found that to be the case, it would certainly be a factor that we would weigh heavily in the negative. We certainly will be investigating it wherever we are looking.

Senator **Humphrey**. Good.

As I understand it, the siting guidelines exempt State parks, is that correct?

Mr. **Rusche**. I believe, in the second repository considerations, we have made an agreement that we would treat them the same as the national parks.

Senator **Humphrey**. Again addressing the particularities of my State, most lakes of any appreciable size in the State are owned and administered by the State. Would that qualify them as being State parks?

Mr. **Rusche**. I can't answer that. I would say that if the State designates them, we will try to honor the commitment that we have made.

Senator **Humphrey**. They are administered for public use and public access is mandated under law. That is something that, I guess, we would have to pursue with you.

Mr. **Rusche**. We would certainly be willing to discuss it with you and your State.

Senator **Humphrey**. I have been asked by the chairman to briefly recess the committee until members can return from the vote. We will ask you to remain, and we will recess until someone returns.

Mr. **Rusche**. I am tied to the table, sir.

Senator **Humphrey**. Thank you.

[Recess.]

Senator **Chafee**. We will continue with the questions of Mr. Rusche.

Mr. Rusche, I just have a couple of questions. I think I am the last one on the list.

What do foreign countries do? You did not cover this in your testimony, did you?

Mr. **Rusche**. No, sir; I didn't.

Senator CHAFEE. Just out of curiosity, what do foreign countries do with their waste?

Mr. RUSCHE. Foreign countries have generally taken a view that, philosophically, geologic disposal is the right long-term course. Some have not made that decision nearly as firmly as we have made it in the United States.

Some have, in the meantime, taken steps that have advanced to a stage further than we have. For example, in Sweden, they have chosen interim storage in big fuel pools for a period that is fairly long, like 50 years or so, with the expectation that eventually the material will be put in crystalline rock.

Senator CHAFEE. Are they taking steps to make the cave in the crystalline rock?

Mr. RUSCHE. They have done some exploratory work for material that is not high level waste. Likewise, in other countries, there have been a number of steps taken in geologic operations for other than high level waste, with the expectation that eventually such operations, or operations like that will be the residence of the high level waste, using more interim storage methods for the high level waste for the moment.

Senator CHAFEE. Has anybody moved beyond interim storage for high level waste, any nation? Has anybody gone to permanent storage?

Mr. RUSCHE. To the best of my knowledge, no nation has implemented it. Certain nations have determined that they will implement it, but at a time in the future, specified specifically, or they have adopted programs that are somewhat like ours that that is the objective of the program.

Senator STAFFORD. Would the Senator yield for one quick question.

Senator CHAFEE. Surely.

Senator STAFFORD. Mr. Rusche, have any nations started reusing spent fuel in fast breeder reactors at this point?

Mr. RUSCHE. Yes. In Europe there is a clear recognition for recycling the material. There are few breeders that are now operating as power producers, but there are two or three.

Senator STAFFORD. Could you name the countries where they are located?

Mr. RUSCHE. In France, for example, France, Germany, and a couple of European countries, are looking to the operation of Super Phoenix, which will be a large breeder. It is a joint effort of several countries. Japan is looking very specifically to the use of breeders in the future.

In response to, are they operating now, in France, in particular. But many countries, particularly in Europe, are recycling material in their nonbreeder reactors, for example, in light water reactors.

Senator STAFFORD. Thank you very much.

Thank you, Senator.

Senator CHAFEE. When you recycle with a breeder reactor, is it a 100 percent recycling, or do you still have some spent fuel left over?

Mr. RUSCHE. At first approximation, the material that is usable is essentially all recovered. One hundred percent in absolute terms may not be recovered, but essentially all of the plutonium, for example, is recycled. When the system is operating in equilibrium, the residual uranium and plutonium are generally both available for recycle. They may not be recycled in the same piece of fuel or at the same time, but the objective of recycling, of course, is to get as much of the material back into the process as you can. Virtually all of it that has not been burned is thus usable.

But each time you go through the recycling process, you produce waste. The waste is not recycled.

Senator CHAFEE. In bulk, how much is a metric ton of spent fuel?

Mr. RUSCHE. The physical size?

Senator CHAFEE. Yes.

Mr. RUSCHE. I would say that a typical fuel element will weigh, in a boiling water reactor or a pressurized water reactor, something less than 1 ton. It is somewhere between a half a ton and three-quarters of a ton.

Senator CHAFEE. I am saying, in bulk. When you say that you stone 1 metric ton, how much space are you taking in cubic feet?

Mr. RUSCHE. Maybe 15 cubic feet.

Senator CHAFEE. Now I have to work that out.

Mr. RUSCHE. Maybe something a foot square and 15 feet long, something like that.

Senator CHAFEE. When you are talking of these 70,000 metric tons in cubic feet, you are not talking volume.

Mr. RUSCHE. It is not huge volume. Let me give you another way to look at it.

Senator CHAFEE. I will put a challenge to you. I am not going to pin you down. In this room, do you have any idea how many metric tons you could store? Nobody is going to secondguess you, so you go ahead.

Senator STAFFORD. I trust you are talking about nuclear waste.

Mr. RUSCHE. I don't know, I would guess maybe, if you compacted it without regard to anything else other than the volume, you could probably get 140,000 tons in here.

Senator CHAFEE. You mean double the initial amount.

Mr. RUSCHE. You could get it all in here. I may be wrong, but if you took the fuel itself——

Senator CHAFEE. I am just talking about what you have to store. I am talking about this high level waste that we have to store, and I am trying to get some concept of the space it occupies. If you say, 70,000 tons, to me, I wasn't sure whether that was a lot or a little as far as space goes.

Mr. RUSCHE. Let me try one other example. If you stacked it up on a football field, you know how big a football field is, it would probably be less than 10 feet deep.

Senator CHAFEE. You mean what, the 70,000 tons?

Mr. RUSCHE. Yes.

Senator CHAFEE. I am not sure that you could get that in here.

Mr. RUSCHE. I thought that we were not going to second guess.

Senator CHAFEE. I was tempted.

Admiral Zech, I am not putting you on the spot, but—yes, I am putting you on the spot. Would you think that that is roughly correct, 140,000 tons in this room?

Mr. ZECH. I think that 140,000 tons, my guess would be, would pretty well fill up this room.

Senator **Stafford**. That is with no spacing.

Mr. **Zech**. Sir?

Senator **Stafford**. All of these questions assume no spacing.

Mr. **Rusche**. That is maximum theoretical density.

Senator **Stafford**. That is an essential requirement, is it not, there has to be some spacing.

Mr. **Rusche**. Yes.

Senator **Chafee**. Does there have to be a lot of spacing?

Mr. **Rusche**. I am not saying a lot, but there has to be some because of the heat load that is produced. The elements are generating heat.

I was going to give you another example, if I may, that might be useful:

Senator **Chafee**. My time is probably up.

Senator **Stafford**. No; you probably have 2 more minutes.

Mr. **Rusche**. May I use one of those, sir?

Senator **Chafee**. Go ahead.

Mr. **Rusche**. If you imagine the repository as being a room underground, a room that would be large enough to contain all of the fuel that we are talking about is on the order of 2,000 to 3,000 acres in surface area, into the floor of which and into the walls of which we would bore holes to put these individual pieces, properly spaced.

Senator **Chafee**. I suppose my question about the storage or the space doesn't make an awful lot of sense because it is not realistic, because of the great amount of space that you have to have between each unit.

Mr. **Rusche**. There are certainly other factors, other than just volume, that have to be taken into account. The heat is the primary one.

Senator **Chafee**. Thank you very much, Mr. Chairman.

Senator **Stafford**. Thank you, Senator Chafee.

Senator Burdick.

Senator **Burdick**. Thank you, Mr. Chairman.

I regret that other duties required me to be out of the committee for all of your testimony. I hope that I don't repeat anything that has been said.

Maybe I look at this thing too simplistically, I am not sure. My question is this: Instead of having one repository, why don't we have several throughout the country, that way we eliminate the problems associated with transportation.

I understand that you have to have an area that has a certain type of rock in order to build these things. Is there an aggregate that you could compose, like cement, but with some of this rock material, that could endure for long periods of time?

We built the Roman temples, and they lasted for a couple of centuries. We could build these repositories in more places, for example, in every area where the material is produced. Is that feasible, then you eliminate the transportation problem.

Mr. **Rusche**. May I speak to the first point first?

Senator **Burdick**. Yes.

Mr. **Rusche**. Why do we not do it in many locations instead of one, or a few?

Senator **Burdick**. I can give you one reason, nobody wants it.

Mr. **Rusche**. I think the other side of the coin is true now, Senator. Many folks have it. We have reactors in 27 States, and we have storage basins with those reactors. The Commission has, and may even this morning reiterate that storage in those basins is judged to be safe for a period of time. It requires attention and maintenance, and so forth, and the judgment that has been made is that that is not the right long-term place or manner in which such materials must be stored.

Now, if I can get to the second point, you will recall that we are not talking about storing these materials for 100 years or a couple of hundred years. We want to isolate them from the biosphere with great confidence for 1,000 years, and we would like to have high confidence that they will be isolated for periods longer than that. That is why we look to certain types of rock rather than manmade structures.

We do not have good historical data that would suggest that any of the structures that man makes and might put on the surface, we would have high confidence, would survive any political or social strife that might occur. Therefore, you turn your attention to things deep in the Earth where they are relatively isolated from man's activities and from which you can look at the geologic record and have high confidence that it has been stable in the past, therefore, you will have some confidence that it will be stable for periods of time we are looking for in the future.

Have I answered your question at all?

Senator **Burdick**. Don't we have some scientific knowledge, and don't we have some aggregate material available that doesn't break down. To say that the Roman temples lasted a couple of centuries, they have lasted 2,000 years. Don't we have materials that can stand up almost to eternity?

Mr. **Rusche**. No, sir.

Senator **Burdick**. We don't.

Mr. **Rusche**. Not for that long.

Senator **Burdick**. Then we don't have anything that will stand that long.

Mr. **Rusche**. The best thing we can find, and the thing that has the greatest confidence, is geologic material, rocks, those are the things that we can tell have been there for the longest period of time, have been undisturbed, therefore, we have the greatest confidence will remain undisturbed for the period of time of several thousand years in the future.

Senator **Burdick**. In other words, you are telling me that it is not very practical or possible to make a manmade repository.

Mr. **Rusche**. That is the judgment that we have made.

Senator **Burdick**. That is what you are telling me.

Mr. **Rusche**. Yes, sir.

Senator **Burdick**. If we could, it would eliminate a lot of problems.

Mr. **Rusche**. They would still have to be somewhere. Maybe your State is more interested than I know.

Senator **Burdick**. No.

Mr. **Rusche**. You seem to provide an incentive that I may have to go back and think about.

Senator **Burdick**. We will store what we produce in North Dakota.

Thank you, Mr. Chairman.

Senator **Stafford**. Thank you, Senator Burdick.

Mr. Rusche, just to get the record replete in front of our committee, as I understand it, the underground facility to hold all of the anticipated waste that you can foresee, 140,000 tons, would occupy some 2 to 3,000 acreas underground, did I understand you to say that?

Mr. **Rusche**. For all of it, it will probably be in the range of several thousand acres. I used the number 2,000 for the design of the first repository.

Senator **Stafford**. Do I recall correctly, is 640 acres a square mile?

Mr. **Rusche**. I believe that is right.

Senator **Stafford**. That is in North Dakota, not Vermont.

Mr. **Rusche**. If we can find any with 680, we will take them.

Senator **Stafford**. If it all were in one facility, it would involve an underground cavern that would occupy several square miles.

Mr. **Rusche**. A few square miles, yes.

Senator **Stafford**. On the surface, just so we will have it in the record, the material before me indicates that the surface facility for a repository would occupy about 400 acres. Is that about right?

Mr. **Rusche**. Yes, sir.

Senator **Stafford**. And there would be a restricted area of about 2,000 acres above ground and surrounding the facility itself. Is that correct?

Mr. **Rusche**. Approximately, yes. It depends on the number of minor design features, but it is approximately right.

Senator **Stafford**. The control area on the surface would extend out to approximately 10 kilometers or 6 miles, roughly in each direction from the facility. Is that right?

Mr. **Rusche**. I think that is right, although the direction might not be circular. It might have some other feature than circular.

Senator **Stafford**. These are just approximations so that we can understand better what we are talking about.

Mr. **Rusche**. That is about right.

Senator **Stafford**. Thank you.

Senator Mitchell, do you have additional questions?

Senator **Mitchell**. Yes; just a couple, Mr. Chairman.

Mr. Rusche, a couple of things you said raised a question in my mind. The first repository, you indicated, is to be located in the west, those are the sites you are considering.

Mr. **Rusche**. If they are found acceptable after characterization.

Senator **Mitchell**. The sites that you are considering for the second repository are generally in the east. You also said that when the first repository opens, you would take the oldest spent commercial fuel first for location in that. The older plants are in the east, therefore, the oldest spent fuel is in the east. The most recent plants are in the west and south, therefore, the more recent fuel is in the west and south.

Are you creating a situation where you are going to transport waste now in the east to a western repository, and then transport waste now and in the future to be developed in the west to an eastern repository.

That seems to be the inevitable conclusion from the two statements you have made, although they were made in different contexts.

Mr. RUSCHE. Perhaps we ought to put them in the same context, if I can.

Senator MITCHELL. I wish you would.

Mr. RUSCHE. We do not envision that being quite as you have described it. In the first place, most of the spent fuel is generated in the central and eastern part of the country, both old and new.

Senator MITCHELL. Is that both commercial and military?

Mr. RUSCHE. Depending on how you measure the quantities, the major quantities are in Washington State, Idaho, and South Carolina.

Senator MITCHELL. Which are not eastern.

Mr. RUSCHE. South Carolina is pretty well east.

Senator MITCHELL. Not northeast.

Mr. RUSCHE. Not northeast, you are right.

The population of commercial nuclear plants is largely in the eastern half of the country.

Senator MITCHELL. Existing plants.

Mr. RUSCHE. When you look at the population, the general population of plants, it is in the eastern half of the United States. There are plants in the west to be sure, but most are in the east.

If the monitored retrievable storage facility is approved, and the first repository proceeds, we are looking at whether or not we would move that western fuel back to the east, and we would very likely would not. We would make arrangements for that western fuel to go directly to the western repository, with appropriate minimal handling facilities there. We would move the material in the east to the monitored retrievable facility for compacting and packaging, so that we can minimize the transportation impacts, and then move it to the west.

If subsequently we locate a repository in the east, as a result of the second repository siting activity, we would have to look at the logistics to avoid part of the problem that you are talking about. The problem would not be quite as exacerbated as you suggest in that most of the fuel originates in the east to start with.

The question might then be whether we needed a second monitored retrievable storage facility or not, and we are just too far away in time to make those predictions with confidence. I think getting the first system is the key to addressing all of these issues.

Senator MITCHELL. Just one more question. Since the total quantity of waste, and the volume of space which it occupies are very relevant indeed to form a decisive consideration in this matter, have you devoted any time or energy to the development of an investigation of the practices now being followed within the industry, and any suggestions that could be utilized to reduce both the quantity of waste and the volume of waste which they occupy so as to make the problem of storage ultimately a less difficult one?

Mr. RUSCHE. We have looked at the question, and I think the simple answer is that the quantity, if I can use that term to describe the fission products themselves, is purely dependent on the amount of energy developed. So, if you are going to produce a kilowatt, you are going to produce a certain amount of waste.

Senator MITCHELL. You mean there are no alternative methods of doing that which might produce lesser quantities?

Mr. RUSCHE. No; when you produce a fission, you get fission products. The fission is what produces the energy. There are considerations which might allow you to produce more fission, and the industry looking at what some might call the standard burn of fuel, some members of the industry will conclude that where the economics warrant it, it is appropriate.

A lot of the material that has been generated so far was not produced in that regime. We recently provided a report on the potential extended burn up and its effects on repository design and so forth. We will be glad to provide you with a copy of that. I will give you a copy of the report, if you would like it.

Senator MITCHELL. Yes; I would like that.

Thank you very much, Mr. Chairman, and I will submit the rest of my questions in writing.

Senator STAFFORD. Senator Hart, we have been going on a 10-minute cycle.

Senator HART. Mr. Chairman, I just have a couple of questions.

Mr. Rusche, I would like to know what the administration's position, if any, is on Senate bill 1162, which I introduced last spring, and which the chairman of this committee has cosponsored, among others.

The background is that the nuclear waste disposal policy in the early 1980's, which some of us were involved in, contained a section 112 which required the Department of Energy to take into account transportation related issues in selecting the permanent repository. But many of us found, in the selection guidelines and the environmental assessment, that the Department really wasn't considering the potential hazards of transportation.

My understanding is that by the end of this century, conservative estimates are that there could be as many as 120 shipments of radioactive cargo a day. In my own State, those estimates indicated that there could be as many as 6,000 shipments a year, or about 16 a day.

If the cargo were going westward, for example, it would run virtually right through Denver.

My question is this: When will the administration take a position on that bill which requires a very thorough consideration for accidents, in particularly urbanized areas, with certain conditions at a particular time of the year, and so forth, in the site selection?

Mr. RUSCHE. With respect to the bill, Senator, I am not able to comment at the moment. My memory is not adequate. I do not believe that we have taken a position on the bill.

I will give you some information on that particular point. Let me address the substance of that. I believe some of the information quoted is not consistent with the facts that I have in two respects.

One, we do consider transportation as a factor in looking at the suitability of sites for characterization. We have not and do not conduct the kind of detailed analysis that will be appropriate when the site is finally adopted, going to the point of detail, argument, and so forth. We have made numerous calculations, and we report on the final environmental assessments.

The question that we look at with respect to the transportation is, for the sites we are looking at, can you get to the site within their immediate environment. Then, within the National System of Highways, and so forth, are there accessible railroads and highways that will permit one to move the material from one place to the other.

We will work with the Department of Transportation to determine the suitable routes, the highways, and so on, and the railroads, as to the acceptable routes from the health and safety standpoint.

The Nuclear Regulatory Commission, as one of the regulators, is charged with certifying the acceptability of casks in regard to the health and safety requirements. We are, therefore, doing what your bill is recommending and would require. I believe we will be giving consideration to the matters in Colorado, and will be carried out.

Senator HART. I think the distinguished chairman of this committee and others are equally concerned, at least in the preliminary stages, about the selection guidelines. It is felt that insufficient attention is being paid to the potential for accidents and the degree to which the normal highway routes go through major urban areas where an accident might occur.

Last winter, we had a major accident at a intersection of interstate in a metropolitan area of a million-and-a-half people, a semitrailer truck loaded with torpedoes tipped over. If those had been casks of high level nuclear waste that had fractured, we would have had a real serious problem on our hands.

So I appreciate your assurances on the subject, but my own reading of the record, at least in the preliminary stages, is that these kinds of factors haven't been given enough consideration. I would appreciate, and I think the chairman as well, if you would take a position on that bill. The bill has been around for almost 6 months now, and it does affect the task of permanent siting, so someone on your staff might want to take a look at it.

Mr. RUSCHE. I will be glad to take a look at it. I wonder if I might make one offer in view of the fact that we apparently have different information. The number of shipments you quoted are just not consistent with our understanding and expectation. I would welcome the opportunity personally, and with some of my staff to meet with you at an appropriate early time, when we can take more time and show you what we have done, what we are doing, how we are going about it, and have the benefit of your reaction and advice. We would delight in that opportunity. If I may take the initiative, I will assume that responsibility to see that opportunity.

Senator HART. I appreciate that.

Thank you, Mr. Chairman.

Senator STAFFORD. Thank you, Senator Hart.

Since I am a cosponsor with Senator Hart on the legislation, I would like to be included.

Mr. RUSCHE. We will do it in tandem.

Senator STAFFORD. Very good.

Mr. RUSCHE. Thank you, sir.

Senator STAFFORD. Senator Burdick.

Senator BURDICK. I just have one question.

I think in response to a question by Senator Mitchell, if I am not quoting this right, you tell me, you said that you didn't see any possibility of reducing the amount of spent fuel in the future as these procedures go on.

Mr. RUSCHE. I suggested that the work we have done does not suggest that there are major changes. I indicated that they are in the order of a few percent, maybe 10 or 15 percent and, therefore, did not appear to be a significant factor in what is likely to be required in the repository.

Senator BURDICK. That is what I thought you said.

Mr. RUSCHE. Yes, sir.

Senator BURDICK. When you made that statement, you didn't take into consideration the feasibility or the possible feasibility of a breeder technology. I understand that it consumes much more of the fuel than the present method. Did you consider breeder technology when you made that statement?

Mr. RUSCHE. In the literal sense, I did not, but that statement is still valid in the sense that, as I tried to respond to Senator Mitchell, for each kilowatt of power that you generate, to first approximation, you produce a certain amount of waste, whether it is in a burner reactor, current reactors, or whether it is in a breeder. We would have to dispose of that waste regardless of whether the material is operating in the breeder cycle or not.

It is certainly true that if we were operating a breeder cycle, less new uranium would be required to be mined. That is, we would extract a much larger fraction of the energy latent in the uranium as extracted from the Earth, but the amount of waste that would be generated in this case would be generated as a result of and attendant to the reprocessing operation would still require about the same amount of disposal capacity. So the statement is valid in either case.

Senator BURDICK. If less uranium is used under the breeder technology, you would have less waste than using the other technology, wouldn't you?

Mr. RUSCHE. No, sir; not in the sense that waste or the fission products—there is the same amount of fission products in the first approximation produced for each unit of power that is generated, either by a breeder or a burner reactor.

Senator BURDICK. I am out of my field here. I am not a scientist, but I have been told that the breeder reactor technology consumes more of the original fuel than the other technology.

Mr. RUSCHE. It does indeed consume more of the original fuel, therefore, you require less of the original uranium. You don't have to mine as much uranium. But for every bit of consumption, it produces nominally the same amount of waste. So it does not change the amount of waste that is produced.

Senator BURDICK. Thank you.

Senator STAFFORD. Thank you, Senator Burdick.

Thank you very much, Mr. Rusche, we appreciate your joining us this morning.

Mr. RUSCHE. Thank you, sir.

Senator **Stafford**. The next witness will be the Honorable Nunzio J. Palladino, the Chairman of the U.S. Nuclear Regulatory Commission, and he is accompanied by Commissioner James Asselstine, Commissioner Frederick Bernthal, and Commissioner Lando W. Zech, Jr.

Chairman Palladino, I note that you have both a long and a short statement. We will place your longer statement in the record if that is your wish.

Mr. **Palladino**. We would appreciate that, Mr. Chairman.

Senator **Stafford**. We would appreciate it in view of the lengthy questions and the lateness of the morning, if you could make the presentation in about 10 minutes, and any of your colleagues could make brief presentations as well.

STATEMENT OF HON. NUNZIO J. PALLADINO, CHAIRMAN, NUCLEAR REGULATORY COMMISSION, ACCOMPANIED BY COMMISSIONER JAMES K. ASSELSTINE; COMMISSIONER FREDERICK M. BERNTHAL; AND COMMISSIONER LANDO W. ZECH, JR.

Mr. **Palladino**. We appreciate this opportunity to appear before your committee today to provide the Commission's views on a number of activities in the national high level radioactive waste management program.

As you indicated, we do have a longer statement, and we will submit it for the record. Among other things, the statement updates all of the activities that you have asked us to comment on in detail, except possibly for last minute questions which we just received over the weekend. I will discuss each of them in turn, starting with the NRC comments on the Department of Energy mission plan.

The NRC has carefully reviewed prior drafts of the DOE's mission plan and provided comments to DOE.

First, we are encouraged that in the final mission plan, DOE is committed to having a quality assurance program in place and implemented before beginning site characterization. NRC will continue to analyze this critical underpinning of DOE's program as implementation proceeds.

Second, the NRC is committed to identifying and monitoring major licensing questions sufficiently early in the pre-licensing period so that DOE can resolve our comments without delaying either DOE's activities or the NRC licensing process.

Third, the reference mission plan schedule allows 27 months for NRC to consider an application for construction authorization. The Commission is committed to making the license review as efficient as possible. However, we believe that the 3 years provided by the Act is a very optimistic estimate for the time required, and that even this depends on the submittal of an acceptable, complete application of high quality.

There remains the question of the timing of DOE's preliminary determination under section 114(f) of the act. As stated in the mission plan, DOE intends to make the preliminary determination required by the act at the time three sites are recommended to the President for characterization rather than after completion of site characterization. This was a matter raised during the Commission's concurrence process on the DOE siting guidelines.

On October 16, the Commission determined that DOE's modified position regarding the timing of the preliminary determination was not a necessary condition for NRC's prior concurrence in the DOE siting guidelines. On October 24, 1985, we conveyed our continued concurrence on the guidelines in a letter to DOE. Commissioner Asselstine disagrees with the Commission's position on the timing of the preliminary determination and will provide additional comments on this issue separately.

As you are aware, DOE is now evaluating plans to include the monitored retrievable storage facility as an integral element of its preferred high level waste management system. Should Congress decide to authorize this approach, the necessary regulatory framework will be available on a schedule consistent with the mission plan.

Before leaving the subject of the mission plan, let me reiterate that the NRC's ability to complete actions on schedule is dependent on DOE efforts to develop the information needed to resolve technical questions, maintain high quality technical programs, and prepare high quality licensing submittals.

You also requested our comments on the recently promulgated EPA standards for management and disposal of high level radioactive wastes. The NRC will soon initiate rulemaking that will amend 10 CFR 60 as needed for consistency with the EPA standards.

The NRC's Advisory Committee on Reactor Safety has expressed concern that the EPA standards are unreasonably restrictive and that demonstration of compliance will be extremely difficult. The Commission held a public meeting to explore these concerns.

Although the NRC staff continues to believe that the EPA standards can be implemented, it is considering the ACRS's concerns in its recommendation for the Commission's implementation of the proposed EPA standards.

You also asked for the status of NRC efforts to refine the definition of high level waste. Under the Nuclear Waste Policy Act, the NRC has the authority to expand the definition of high-level waste to include "other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation."

The technical, legal and institutional issues requiring resolution by such an expanded definition are under study by the NRC. The NRC anticipates that completion of the rulemaking of the definition of HLW will require 2 years.

Finally, you asked for a report on our activities concerning the transportation of spent fuel. As you know, DOE has made commitments to comply with all applicable NRC and Department of Transportation regulations for the transport of HLW and spent fuel. DOE plans to require all casks used to transport commercial spent fuel under NWPA to be certified by the NRC, and we will assure that the transportation vehicles meet all DOT requirements.

NRC has been and will continue to be involved in a number of transportation related activities bearing on the implementation of DOE's NWPA responsibilities. NRC is currently comparing its cask certification requirements against existing data on severe non-nuclear transportation accidents in our continuing efforts to confirm the adequacy of our transportation rules.

We expect the results of this assessment, called the modal study, to be made available for peer review early next year. NRC also plans to update the Generic Environmental Statement supporting our existing transportation rules. This update will be completed in time to support our review of any DOE application.

NRC also noted transportation concerns in its review of DOE's draft environmental assessment on potential repository sites earlier this year. The staff advised the DOE that the convergence of shipping routes to an MRS or repository creates corridors along which the comparatively large number of shipments per year may increase environmental impacts beyond those now encountered in transportation of large quantities of radioactive materials. DOE has said that it will study this corridor effect in more detail in preparing EIS's for the MRS and repository.

This concludes my prepared remarks, Mr. Chairman. We will be pleased to answer any questions that we can.

Senator STAFFORD. Thank you, Mr. Chairman.

I have a couple of questions, but first we understand, Mr. Asselstine, that you have a statement, and we will hear that.

Mr. ASSELSTINE. Mr. Chairman, I have a prepared statement that addresses the timing of the preliminary determination. I don't propose to read that, I will just submit it for the record. I would like to make just a couple of broader points about the DOE program.

Senator STAFFORD. We will place your statement in the record, if there is no objection.

STATEMENT OF JAMES K. ASSELSTINE, COMMISSIONER, NUCLEAR REGULATORY COMMISSION

Mr. ASSELSTINE. I have two broad concerns about the DOE program. My first is that DOE seems to be willing to take a less than conservative approach to addressing the key technical issues in the program if that is what is necessary to adhere to the schedule for developing the first repository in the Nuclear Waste Policy Act, and particularly if that is what is necessary to meet that 1998 date for operation of the first repository.

My second concern is that DOE has failed to achieve an effective and cooperative working relationship with the States that are affected by this process, and the situation seems to be getting worse. Indeed, I think that as DOE proceeds with implementing the act, its credibility with the States is going down, and there is a potential that our credibility at the NRC will go down as well.

Let me mention just a couple of things that I think could be done to address those two concerns, and I can elaborate on them later if there are questions.

First, I think the problem isn't so much with the act, and the framework that it establishes, it is with DOE's implementation of the act. With the possible exception of clarifying what the Congress had in mind in the timing of the preliminary determination, I don't see the need for reopening the legislation. But I think that the Congress does need to make it clear to DOE that a careful, conservative approach to resolving the key technical issues and the key safety issues on the Repository Program has to take precedence over the schedule. I think that that is a very key factor in addressing some of the problems that I see with the current implementation.

Next, I think there is a need to reexamine the site selection process, including the adequacy of DOE's site selection guidelines, and DOE's methodology for deciding which site to nominate and select for characterization. I think that really ought to be done before sites are nominated and selected for either the first or the second repository.

We all should understand how DOE is weighing these various factors that are being considered, and whether the guidelines really provide an effective screening process for identifying potentially good sites.

Finally, I think that DOE simply has to develop a much better working relationship with the States. There has to be a sense of trust on both sides. DOE has to demonstrate to the States that its program is guided by technical merit, and not by meeting some arbitrary schedule.

Thank you.

Senator STAFFORD. Thank you, Mr. Asselstine.

Admiral Zech, or Commissioner Bernthal, do either of you have a statement?

Mr. ZECH. I don't have a prepared statement, Mr. Chairman, but since Commissioner Asselstine has indicated that his opinion is that DOE is taking less than a conservative approach to this matter, I would respectfully disagree with that. I think they are taking a conservative approach.

He also mentioned, I believe, that he thinks that they are putting the schedule ahead of this conservative approach, and I also disagree with that statement. I think they are taking a conservative approach. I think they are realistic about their schedule, although, as Mr. Rusche pointed out, we are on new ground here, all of us. It has been my opinion that DOE has indeed been taking a conservative approach, working very carefully with the NRC staff.

Their intention, and NRC's intention, is to continue this conservative approach. Certainly our recommendation would be, and I believe theirs, too, if we come to the point where we feel that we need more time, I feel certain that we will take it rather than proceed.

With that, Mr. Chairman, I thank you very much.

Senator STAFFORD. Thank you, Admiral.

Mr. Bernthal, did you have a comment?

Mr. BERNTHAL. I have no comment at this time.

Senator STAFFORD. Mr. Palladino, and your colleagues, in response to questions by the committee, Mr. Rusche today indicated that DOE is relying heavily on EPA standards and NRC regulations to assure protection of public health and safety.

For the committee's benefit, would you explain how NRC has been exercising its independent authority to provide this protection. In particular, what attention has NRC been giving to protect public health and safety in rural areas?

Mr. PALLADINO. Mr. Chairman, the NRC has been working closely with EPA in the development of the standards, and has made a number of comments, some of which were accepted, and some of which were not. However, the staff and the Commission concur that the standards are reasonable, although our ACRS feels that the standards are unreasonably restrictive.

The staff feels that the standards can be implemented and is ready to proceed to amend our regulations to conform to those standards.

Mr. BERNTHAL. Mr. Chairman, if I could make a brief comment.

Senator STAFFORD. Mr. Bernthal.

Mr. BERNTHAL. It is not entirely clear to me that the last word is in from the ACRS on this issue either. The Commission did have a meeting on that subject, and it appears that it is possible, at least, that there was a misunderstanding as to the exact meaning of the words that were in that EPA standard. So I will hold any opinion in abeyance until we settle that issue.

Mr. ASSELSTINE. Mr. Chairman, I wonder if I could add a brief comment as well.

As the chairman has said, we basically put our regulatory framework in place. We have our technical regulations. Now that EPA has issued its standard, we have to make sure that our technical regulations now conform. That part is done. The difficulty is that that part really comes into play down the road, years down the road, when we get a license application from the Department of Energy.

The process that we are involved in now is the pre-licensing work when much of the technical information and the site exploration work will be done to support the license application. Those are very critical steps, because if they are not done properly, good sides are not identified and selected. If the site characterization work is not done properly, then DOE will not be able to supply us with a complete and high quality license application down the road.

I think that what we need to do during this early stage is to make sure that we are doing as much as we possibly can with DOE, when we have less regulatory control, to make sure that these steps indeed provide the information that we really need. I think that this is an area of concern to me and also to some of the States.

Senator STAFFORD. Thank you.

Are there any further comments?

[No response.]

Senator STAFFORD. If not, let me ask one more question, which is a matter that Senator Hart brought up in connection with the legislation which he created, and which I have cosponsored.

Do you believe that it is wise from a public health and safety perspective to transport high level waste by truck over mountain roads where snow is common in the winter, as to the whole snow belt, I guess?

Mr. PALLADINO. Mr. Chairman, the question of what routes will be used will depend on where the final repository or the MRS is located. Transportation is an important element in the consideration of where a site would be located, but more importantly, after the site is picked, then the selection of routes would be very important, and this would be done by DOT in consultation with DOE. We would certify the casks and are studying it very carefully to make sure that the casks are suited to the job.

As I indicated in my prepared testimony, we are concerned that the routes that converge to the repository and the MRS may cause a crowding, or may have a corridor effect that we feel deserves more study, and DOE is looking into that.

Senator **STAFFORD**. Thank you.

Any other comments?

Mr. **ASSELSTINE**. Mr. Chairman, as Chairman Palladino has said, transportation is an important factor once the repository is sited, but I also think that it is an important factor in deciding which site you are going to consider for repository development.

I think the problems that you and Senator Hart have identified on transportation is not just limited to transportation. Part of the difficulty with the site selection guidelines that the Department of Energy has developed, quite frankly, is that they are not very specific in identifying with some degree of precision what factors you will consider or won't consider in deciding which site to go forward with, how you will weigh those factors, and particularly in deciding what factors are so significant that you would disqualify a site for those particular conditions.

That is one of the weaknesses that many States have identified in the guidelines. I think that transportation is an illustrative example, but it is not exclusive.

Senator **STAFFORD**. Thank you, Mr. Asselstine.

Any further comments?

[No response.]

Senator **STAFFORD**. If not, Senator Hart.

Senator **HART**. Mr. Chairman, I would like to pursue that a little bit, because I clearly come down closer to Mr. Asselstine's formulation of the relationship.

Mr. Palladino, or any Commissioner, if the NRC is going to license DOE repositories, as contemplated in the law, do you believe that you have the authority to deny a license on the grounds of transportation problems?

Mr. **PALLADINO**. If we felt that there was an overriding matter that would impact on the implementation of the repository, I believe that we could, but I am not saying necessarily that this is what is going to happen.

Senator **HART**. What, for example, would be an overriding problem?

Mr. **PALLADINO**. At this point in time, it would be pretty difficult to say. I think that it would depend on the route selected, the routes available, and the location of the site.

Senator **HART**. I noted that in your prepared statement, you said that this was a DOE consideration, therefore, NRC didn't have to take a position on S. 1162.

Mr. **PALLADINO**. Yes, we did say that.

Senator **HART**. It seems to me that you are going to have to take a position, aren't you, or are you, because it tries to answer that very question, what weight to give to various factors, and what kind of consideration to give to transportation factors and problems.

Mr. **Palladino**. You raise several different questions. One, you ask whether or not we could withhold a license if we felt that there was an overriding problem in transportation. I expressed the belief that we could, but I have not checked that with my legal counsel.

Then there is the question of selecting the site, and what factors ought to be considered and how they ought to be weighed, and that is a DOE function. We felt that that is where the bill is concentrating, and we felt that this was something that DOE should respond to.

Senator **Hart**. If DOE certifies that, in effect, there are no serious or overriding transportation implications in a site selected, is that the end of the matter, or do you believe that you have the authority, or ought to have the authority, to independently look at that yourselves?

Mr. **Palladino**. Into the impact on the adequacy of the site?

Senator **Hart**. All transportation factors, routes, population concentrations, weather, all of those things.

Mr. **Palladino**. I can't say that we have taken a position on that. I would say that the matter rests primarily with DOE, our responsibility being certification of the casks by and large.

Mr. **Bernthal**. Senator, my understanding, and I have conferred a moment here with counsel, is that in fact, as a requirement under NEPA, the NRC may have to take such factors as transportation and environmental impact as a consequence of transportation into consideration.

I have been advised that a determination on exactly how we go about that has not yet been made, but the simple answer to your question, I believe, is yes.

Mr. **Asselstine**. Senator Hart, if I could add.

Senator **Stafford**. We are in second bells now, do you want to continue now?

Senator **Hart**. No. I will let Mr. Asselstine comment, and then that is it.

Mr. **Asselstine**. I agree in theory with what Commissioner Bernthal just said. Clearly we have the authority, and at issue in the licensing process will be all aspects of the operation of the repository, including the transportation impacts.

At the same time, as a practical matter, if we don't pin down now what the specifics are for transportation, as well as some other key aspects, I think that the Commission is going to be hard pressed later on to say, "no," after we have spent literally billions of dollars exploring these few sites, because the Department of Energy could quite legitimately come back to the Commission and say, "Wait a minute, we developed our site selection guidelines, they were very general, that is true, but you bought off on them. You had the opportunity to review them, and you didn't raise any objection. Why 6 years down the road, after we have spent all of this money, are you saying that there is a basic problem with this site from a transportation standpoint?"

So I think that there is an obligation on our part to help and clarify those things now, rather than push the problem off until later on, when I think it is going to be more difficult for the Commission to carry out its responsibilities later on if it avoids its responsibilities now.

Senator HART. Thank you.

Thank you, Mr. Chairman.

Senator STAFFORD. Thank you.

We will have to recess the hearing until we can get back from this rollcall.

Senator Moynihan, are you going to have questions when we get back?

Senator MOYNIHAN. I have a few.

Senator STAFFORD. We will be in recess for a few minutes, and Senator Moynihan will resume the questioning as soon as he can get back.

[Recess.]

Senator MOYNIHAN. Honorable Commissioners, and our guests, could we have order.

The chairman is necessarily delayed on the floor and will be here in just a bit, but he asked if I would preside for the moment, as I am the only person about who hasn't asked any questions of our Commissioners.

Let me ask just two things. One is a rather specific question.

You are talking about transportation of waste products, and we tend to discuss them as if they were liquid. Out in West Valley, there is that large reprocessing plant. It was built in the 1960's, it received a lot of nuclear waste. Then it turned out that we weren't short of uranium, and there were new regulations, and finally we had that awful mess.

Under President Carter, we were able to get an agreement and an appropriation to take that material and turn it into glassified logs for purposes of storage. That is the only place in the country where this is happening, is that right, Mr. Chairman, that is our national experiment at the moment?

Mr. PALLADINO. It is my impression that it is. I don't know if anyone has different information.

Senator MOYNIHAN. It is your impression. Does anybody know?

Mr. ASSELSTINE. I think in the defense waste area, Senator Moynihan, there is also a similar effort underway there. I think Mr. Rusche could probably address in detail what is going on there.

Senator MOYNIHAN. In any event, this is the way you see us moving in terms of storage, to some stabilized form of this sort, is that right or wrong?

What are you planning to put in the holes in the ground?

Mr. PALLADINO. Mr. Chairman, at the present time, our understanding is that the intent is to store spent fuel, not reprocessed fuel.

Senator MOYNIHAN. Spent fuel.

Mr. PALLADINO. Spent fuel elements, yes.

Senator MOYNIHAN. Let me see if I understand. To be as ignorant of elemental physics as I am, and not to be a lawyer is really kind of inexcusable, because you can expect it of lawyers.

Do you mean spent fuel as we think of spent fuel rods? They will still have a lot of active uranium in them, is that right?

Mr. PALLADINO. Yes; that is correct. In this country, we have not established the program for reprocessing fuel to try to recover the remaining fuel in the fuel elements. Rather, under the concept that is going forward now, the spent fuel elements would be put in the repository.

Mr. Asselstine. Senator Moynihan, I think that it will actually be both, because you have the defense wastes that ultimately will go into the repository as well, and you have some of this waste like at West Valley that came from the commercial program and was reprocessed.

I think that it will be both spent fuel. The bulk of the commercial side will be spent fuel, not reprocessed, and on the defense side, reprocessed high level waste.

Mr. Palladino. On the civilian part, I think that it will be all spent fuel, unless the Nation changes its policy.

Senator Moynihan. Except what we get out of West Valley.

Mr. Asselstine. Except what we get out of West Valley, you are right.

Mr. Palladino. I am sorry, you are right.

Mr. Asselstine. It will be small quantities.

Senator Moynihan. Do you mean that we are going to have these swimming pools down 10,000 feet under the ground?

Mr. Asselstine. No, Senator, I think what you will have is the spent fuel rods put in a package. The Department of Energy has to develop, design, and present for our review a specific waste package.

Senator Moynihan. I was just kidding, but basically it is the swimming pool.

Mr. Asselstine. I think that they will be dry. They will be encapsulated in a dry container.

The Swedes have done a lot of work on this, and they have developed a very advanced capsule that is basically a solid copper container that they put the spent fuel elements in, put in powdered copper, and then basically fuze this into a solid copper block. It is a very strong copper container.

Senator Moynihan. The French have done a fair amount of glassification, have they not?

Mr. Asselstine. That is correct.

Mr. Palladino. But the French are reprocessing their fuel. The wastes that we are talking about there are in a different form and a different amount. There they are not encapsulating the unused uranium or plutonium.

Senator Moynihan. I am not up to this, I am sorry. We depend so much on you, and you are so very helpful.

I would have thought that a decision like this, that you would want to go to the most stable condition, given our present technology, and that the borasilicate is that most stable condition. Is that wrong?

Mr. Bernthal. Mr. Chairman, if I may comment, I think your instincts are good. The fact is, though, as the chairman has already pointed out, unless and until this country changes its mind—this was a decision, I believe, that the Congress made—about reprocessing commercial spent fuel, for the foreseeable future we are committed, as opposed to what the French are doing. You are quite correct, the French are committed to reprocessing and disposing of the waste from the commercial fuel process, the fuel cycle, in borasilicate glass or similar material. We are not committed to do that in this country. Therefore, we are looking at long-term storage of spent fuel underground, rather than reprocessed, glassified waste, as the French are.

Senator MOYNIHAN. Then the question is, what is high level waste, and what is low level waste. High is higher than low, is that the distinction?

Mr. BERNTHAL. I think that distinction is——

Senator MOYNIHAN. Do you have a quantified distinction there?

Mr. BERNTHAL. What we normally term low level waste is the vast array of materials from use of radioisotopes, and the like.

Senator MOYNIHAN. You mean laboratory use.

Mr. BERNTHAL. Everything like that.

Senator MOYNIHAN. We have one like that in West Valley, too. No government has ever been required to make a judgment such as this one. It is not likely that the United States of America will be functioning in a recognizable way 10,000 years from now. It could happen, but the probability is pretty low. So you have to assume that you are going to do this, and in a fairly short order, the human specie will have forgotten that it was done, and it manages itself. Is that right?

These sites can't be managed. You can't assume that in 10,000 or 9,000 years somebody is going to be doing the work that you prescribed here in Washington.

Mr. PALLADINO. Mr. Chairman, the concept behind the repository, the deep geologic repository, is to isolate the fission products and the fuel that is in the fuel elements from the biosphere so that they can be unattended for thousands of years into the future.

Senator MOYNIHAN. Not for just a while, but forever.

Mr. PALLADINO. Eventually forever.

Senator MOYNIHAN. Not just for 10,000 years, but forever. Doesn't this bother you? Doesn't this require us to think? To be sort of good global citizens, does that require that we take the most stable form?

Mr. PALLADINO. One other point, I think, ought to be made. After a certain number of years, and I don't know what that number is, but it is something like 1,000 years, these fission products will have decayed quite significantly.

Senator MOYNIHAN. Is the half life about 1,000 years?

Mr. PALLADINO. There are a whole variety of species involved, some are very long lived, and some are very short lived, and there is a whole spectrum in between. By the order of 1,000 years, what is down in there ought to be not much different from what would naturally be occurring.

Mr. ASSELSTINE. Senator, I think you have put your finger on the challenge of this process—and that is to be able to predict that we have taken a conservative enough approach, both in deciding what form the waste should be in, how it should be packaged, and how the repository should be designed, to be able to predict that the repository will perform and control the release of the materials for as long as they stay hazardous.

Senator MOYNIHAN. Let me ask the Commission, do you understand that you have to plan a system that assumes that the Government of the United States no longer exists?

Mr. PALLADINO. I think that this is the concept behind the deep geologic repository.

Senator MOYNIHAN. That is not the concept behind it. That troubles me. The concept, you could do that with the assumption that you are going to have a continuity in the legal and constitutional and administrative system, because that is the best place to put it anyway. It would be the best place to put it if you had a 50-year problem.

You have to assume that the legal, constitutional, and administrative system under which we live will not be in place during the critical portion of the time span involved. No one has ever had to make a decision like that.

Mr. PALLADINO. I think the assumption is that the legal and constitutional organizations might not exist and, therefore, we are trying to put it in the most stable form that we think has a chance of lasting that period of time.

Mr. ASSELSTINE. We are not relying on institutional controls to maintain this site.

Senator MOYNIHAN. That I understand, but I want to ask you one question. Do you have enough time to make this 1,000-year decision?

I am going to take silence to mean assent.

Mr. BERNTHAL. Mr. Chairman, I think that we have enough time on the Commission. Commissioner Asselstine just alluded to the point, however, that the engineering, the project itself is going forward with the understanding and the presumption, if I understand what DOE has said, that there will be no institutional control assumed past 100 years.

Senator MOYNIHAN. Good, that is what engineers have to do, they have to make a judgment like that. The Reagan administration sees the United States of America disappearing in that 100 years.

Mr. BERNTHAL. I think that is a slight extrapolation.

Mr. ASSELSTINE. Senator Moynihan, on the time question, let me answer perhaps in a little different way than my colleagues.

I am concerned that if you take the deadline in the statute, having the first repository in operation by 1998, and if you treat that as absolute, that in no way can that time deadline be modified, changed, or extended, then I think you begin to get into some problems because there are a lot of these early steps—identifying the sites, designing a canister——

Senator MOYNIHAN. My God, 1998, you can reach out and touch it.

Mr. ASSELSTINE. Yes; that is right.

Senator MOYNIHAN. Admiral, did you want to say something on this?

Mr. ZECH. I would just like to say, Mr. Chairman, you are right, we are plowing new ground and it is not a very simple task, It is a very complex, far-reaching task, with tremendous responsibilities for all of us on the Commission, as well as DOE and the Congress.

It is at least my opinion that we are going to come up with something that involves, as far as the Commission is concerned, a very careful and deliberate and cautious approach to public health and safety for as long as we can, but we have got to recognize that perfection is probably not attainable. We have to have the assurance ourselves that whether or not the Government lasts—perhaps it might, and let's hope it will—the approach that we are taking is a reasonable one. Nevertheless, we have to recognize that certainly one should be very aware of the enormity of the task.

I don't think we have any illusions of divine guidance at all, but I do think that we are trying to be as realistic as we can, and going about this in a very deliberate manner. You are right, it is an awesome task. We are proceeding. I think that it is technically feasible, and I think that we are on the right path.

Senator MOYNIHAN. May I ask the Commission, we don't normally do this up here, but when we do, we have never failed to have your cooperation. Could we ask the Commission, on behalf of the committee, in a formal way to consider this question of the 1998 deadline, and advise this committee, in your collective and individual judgment, whether that ought to be a fixed deadline, whether we ought to look at that legislation again. Would you do that, Mr. Chairman?

Mr. PALLADINO. You would like that submitted for the record?

Senator MOYNIHAN. For the record, your judgment. (See p. 204.) We are asking you. You are our wisemen, and we depend on you utterly. There is not a natural scientist in the U.S. Senate, not one. One served for one term, a geologist, and I used to say that he was the first such since Thomas Jefferson presided. In the history of the U.S. Senate, there has been one natural scientist, so we depend on you.

Here comes the chairman. Mr. Chairman, let me just say what I have asked of the Commission, and see if you wouldn't agree.

The proposal to store nuclear waste until its half-life has gone, and then the full length of its radioactivity, is a task that has no precedent in human experience. Such an effort has never been undertaken. To do something that you know will work for a minimum of 1,000 to 10,000 years, you have to think beyond our present legal and governmental system. Nobody has ever thought in those terms.

The DOE, under statute, has to have one of these repositories in place by 1998, and that is not very long. You can reach out and touch it. I was just asking the Commission if they could give us their judgment about whether that fixed deadline is conducive to the best outcome here, and whether we ought to look at it again.

I think, Mr. Chairman, you are willing to do that.

Mr. PALLADINO. Yes, sir, I think also there is a related question of, "Is it absolutely necessary to meet this date?"

Senator MOYNIHAN. The date can serve some purposes and not others. It may lead you to make decisions which you are really not confident with. We are talking 10,000 years, so we can take as much time as is needed to make the judgment. Would you agree with this?

Senator STAFFORD. I think it will be interesting to have some data from the Commission.

Senator MOYNIHAN. We depend on you. You know that we don't know what you know. There is not a natural scientist in this body.

Mr. PALLADINO. We will be pleased to give you our best assessment of this situation. I should point out that this is not something that we are working on only for a day or two, we are working continuously together, the DOE, the NRC and the Congress, and even the people responsible for transportation, to make sure that as what we learn indicates that we ought to make a change there will exist the opportunity for making a change.

Senator MOYNIHAN. This whole discussion of mountain roads in winter suggests that we are going to store material in a sort of basically unstable manner. If you can't roll out of a truck in the Rockies safely, then you can't be stored for 10,000 years safely.

Mr. PALLADINO. Mr. Chairman, the casks that everyone is worried that they might fail in an accident, have been designed to withstand very severe accident conditions, including testing of 30-foot drops. There have been accidents where there has been serious damage to the truck, but only minor scratches to the casks. So these casks are very carefully and thoroughly designed.

Senator MOYNIHAN. But there is an alternative in the borasilicate route. If you go to glassification, there is an alternative which may be more attractive, and we ought to think about that for us.

Mr. PALLADINO. Yes; but going to the glassification requires going through reprocessing, and it is not the U.S. policy as I understand it.

Senator MOYNIHAN. Mr. Chairman, as you well know, U.S. policy is what the Congress legislates, and we ought to make it U.S. policy.

Thank you very much, I think the chairman wants to move forward.

Senator STAFFORD. Gentlemen, there may be some questions in writing to you, but I think that concludes the matters as far as your testimony is concerned this morning. The committee appreciates your cooperation and your presence here with us.

Mr. PALLADINO. Thank you, Mr. Chairman. We thank you for the opportunity.

Senator STAFFORD. The Chair will withhold for a moment so that the people who are leaving can do so.

We have a number of witnesses to go. It is the Chair's intention, unless there is serious discomfort, to continue until about 1:30. We will be interrupted by a rollcall or two, I am afraid, and then adjourn from 1:30 until 2:30, and complete the hearings. I make this announcement so that those who may want to get some lunch between now and 1:30 will know about it, and those who can put it off until 1:30 will know that there will be an opportunity to do so at 1:30.

The next witness will be Mr. Sheldon Meyers, who is the Acting Director, Office of Radiation Programs of the U.S. Environmental Protection Agency.

Mr. Meyers, you heard me tell the other witnesses, and you are familiar with the procedure, if we have a statement of yours, we will place it in the record, there being no objection, and the Chair sees nobody here who can object. If you could summarize it in about 5 or 6 minutes, we would appreciate it.

STATEMENT OF SHELDON MEYERS, ACTING DIRECTOR, OFFICE OF RADIATION PROGRAMS, ENVIRONMENTAL PROTECTIÓN AGENCY

Mr. MEYERS. Thank you, Mr. Chairman, I will indeed summarize the statement.

I am pleased to be here today to discuss the standards EPA promulgated on August 15, 1985, for the disposal of high level radioactive waste. At the outset, let me emphasize that I have confidence now, and for many years have had confidence, that high level waste can and will be disposed of safely, with the kind of exceptional care that will provide protection for present and future generations.

The Nuclear Waste Policy Act of 1982 established the role of the various Federal agencies in the disposal of highly radioactive waste. The responsibility for site selection, development, and operation of these high level waste sites is that of the Department of Energy, while the licensing of the repository for high level waste is the responsibility of the Nuclear Regulatory Commission.

The Nuclear Waste Policy Act assigned one specific responsibility to EPA as part of the national program. Section 121 requires EPA to promulgate generally applicable standards for the protection of the general environment from off-site releases from radioactive materials in repositories. The standards apply to spent reactor fuel, the highly radioactive waste derived from reprocessing spent fuel, and those transuranic wastes containing 100 or more nanocuries per gram with half-lives of more than 20 years. The standards do not apply to waste which have already been disposed of. Also our standards do not apply to ocean disposal of high level waste which is prohibited by the London Dumping Convention.

Our standards do apply to both management and disposal of the wastes, subparts (a) and (b) respectively. Subpart (a) of the rule applies to the storage of the materials, solidification or other preparation for disposal, and placing the waste at a disposal site. Subpart (a) also applies to spent fuel management regardless of whether the fuel is considered to be a waste or destined for reprocessing.

In subpart (b), we are devising an environmental standard for the period after the repository is sealed. The requirements we established in subpart (b) can only be implemented by the NRC and the DOE in the design phase by setting design principles or by analytically projecting disposal system performance.

The more familiar concepts of implementation involving monitoring of emissions for ambient levels of pollutants are not applicable here because we cannot rely on such surveillance for the long time periods involved. Our rule, for instance, speaks of isolation for 10,000 years.

For long-term containment requirements, we assume that it is possible to predict some aspects of the future well enough to use the predictions for comparing and selecting disposal methods. Thus, we evaluate ways that wastes might be released from a mined geologic repository, develop analytical models to predict potential releases and their distribution throughout the ecosystem over a 10,000 period, and we estimate the possible risk that could result from these releases if they occur in an environment similar to the one we know today.

The standards in subpart (b) must accommodate large uncertainties, uncertainties in our current knowledge about disposal techniques, and the inherent uncertainties about the future. The future is by definition unknown. So protecting the public health and the environment, we think, involves encouraging use of disposal systems that are tolerant of potential mistakes in engineering design or site selection.

We face these issues by developing assurance requirements which try to address and compensate for the uncertainties that necessarily accompany plans to isolate these dangerous wastes from the environment for such a long time period. No matter how promising analytical projections of a given disposal system's performance appear, high level and transuranic wastes should be disposed of in a cautious manner that reduces the likelihood of anticipated releases.

In abbreviated form, the six qualitative assurance requirements in our high level waste standard to protect against release of radioactivity to the environment are these:

(1) Disposal systems shall not depend on active institutional controls for more than 100 years after disposal;

(2) Long-term disposal system performance should be monitored for a reasonable time as a supplement to other types of protection;

(3) Disposal systems shall be marked and their locations recorded in all appropriate governmental records to reduce the possibility of unintended disruption by future generations;

(4) Disposal systems shall be designed with several different types of barriers, both natural and engineered;

(5) Sites should not be located where scarce or easily accessible natural resources are located; and

(6) Waste shall be recoverable for a reasonable time after they are disposed of, if necessary, due to events unforeseen at the time of disposal.

The containment and assurance requirements, we feel, are complimentary. The containment requirements set limits on potential releases of radioactive material. The assurance requirements provide the framework necessary to develop the kind of confidence we need to meet the containment requirements even in the face of uncertainties inherent in a process of such enormous duration.

In the final standards, the assurance requirements only apply to DOE controlled facilities. However, the NRC has committed to including provisions on these same matters in their own regulations for NRC licensed facilities.

Due to concerns raised by many States and individuals during the comment period, the final standards now provide for both groundwater and individual protection requirements. Disposal systems for high level waste shall be designed to provide a reasonable expectation that for 1,000 years after disposal, the radionuclide concentrations averaged over any year in water withdrawn from any portion of a special source of ground water shall not exceed the agency's interim drinking water standards which are 5 picocuries per liter of radium 226 or radium 228, 15 picocuries per liter of alpha ray emitting radionuclides, or the combined concentrations of radionuclides that emit either beta or gamma radiation that would produce an annual dosage equivalent to the total body or any internal organ greater than 4 millirem per year if an individual consumed 2 liters of drinking water per day from such a source of ground water.

The standards also include individual protection requirements providing that the repository's undisturbed performance will not result in individuals receiving more than 25 millirems to the whole body, or 75 millirems to any organ, for 1,000 years after disposal.

In evaluating compliance with this provision, all potential pathways from the disposal system to people shall be considered, including the assumption that individuals consume 2 liters per day of drinking water from any significant source of ground water outside the controlled area.

The issues related to the development of EPA's high level waste regulation were very difficult in both their philosophical and technological aspects. Throughout this process, our working relationships with the Department of Energy and the Nuclear Regulatory Commission were extraordinarily good. The effort was characterized by professionalism on all sides in a cooperative spirit that seemed to say, let's get the job done.

Finally, you asked a question about whether we had any pending litigation. As far as I know, there is no pending litigation on the high level waste regulation as of this time.

This concludes my statement, Mr. Chairman. If you have any questions, I will be pleased to answer them.

Senator **Stafford**. Thank you very much, Mr. Meyers.

There may be questions from other members of the committee who obviously can't be here at the moment. If there are, they will be submitted in writing to you, if that is agreeable, for your early response.

Mr. **Meyers**. That is fine.

Senator **Stafford**. I have one or two that I will ask you now.

Mr. Rusche of the Department of Energy has said regulations of EPA and NRC will be relied on to protect people's health and safety. In regulations recently published, EPA has chosen to provide added protection to class I aquifers which are likely to be in relatively urban areas.

Since DOE is prohibited under the Nuclear Waste Policy Act from siting a repository in a densely populated area, EPA is providing added protection to aquifers that are least likely to be subject to contamination from a nuclear waste repository.

Rural aquifers where a nuclear waste repository is more likely to be located are not afforded the added protection, yet many of these aquifers provide drinking water to rural residents and water for crops.

On what basis did EPA determine that added protection of this source of groundwater was unnecessary?

Mr. **Meyers**. There are several parts to the regulations, Senator. The second part for individual protection does have a provision for sources outside of the controlled area, which, as you heard from Mr. Rusche, will be relatively small. There we have a millirem limit that I mentioned earlier, 25 millirems for the whole body, and

75 millirems to a critical organ, and that includes drinking 2 liters of water a day. We feel that that particular part of the rule itself does offer the adequate protection.

Additionally, a National Academy of Science report indicated that no more than 15 percent of the dose that would be received by any member of the public would come from drinking water.

Senator STAFFORD. In describing a "special source" of ground water in the regulation, EPA states that such sources are those "supplying drinking water for thousands of persons." How many is thousands of persons, 2,000 or 20,000?

How is another agency to apply these regulations in an appropriate manner if such critical terms are left undefined?

Mr. MEYERS. As you know, Senator, in developing this regulation, we accepted the Agency's ground water strategy, and we didn't feel that it was appropriate to second-guess our Agency experts in the field. It is open to interpretation, and I assume that it was meant to be somewhat open to allow local authorities to make some judgments in that arena.

Senator STAFFORD. Parenthetically, I would note that in Vermont, we consider 500 people in one place a metropolitan area.

As I understand it, the repository is not required to be designed so that there will be no releases of radioactivity into the environment around the repository. Rather the EPA standards and NRC regulations require that releases be within certain limits. For example, EPA predicts, as we understand it, that when all of the reactor waste is disposed of in accordance with the proposed standards, that it would cause no more than 1,000 premature deaths from cancer for the next 10,000 or 100,000 years, which is about 1 premature death every 10 years.

If a repository were located near the Canadian border, would it be possible that some of these premature deaths would be among Canadians?

Mr. MEYERS. I don't know. I would have to take a look at our analysis.

Senator STAFFORD. Why don't you answer that one in writing, if you would.

Mr. MEYERS. I will be pleased to.

[The following was supplied in response to Senator Stafford's question:]

Question. If a repository were located near the Canadian border, would it be possible that some of these premature deaths would be among Canadians?

Answer. To determine if any premature deaths caused by a high-level radioactive waste repository near the Canadian border would be among Canadians would require a detailed site-specific evaluation. The most probable mechanisms for repository releases to the accessible environment are through water transport. A site would have to be evaluated as to its hydrogeological characteristics and the possibility of contaminated water reaching Canadian citizens.

Senator STAFFORD. Subject to other questions in writing from other members of the committee, let me express, on behalf of the committee, our appreciation for your joining us, Mr. Meyers. That will conclude your part in the program today.

We now go to our first panel, and there are six members to the panel, if they are all here. Mr. Leonard Wilson, secretary for environmental conservation, the State of Vermont; Mr. John W. Green, interim director, department of energy and transportation, State of Mississippi; Mr. Warren A. Bishop, chairman, nuclear waste board, State of Washington; Mr. Dean Tousley, attorney for the Yakima Indian Nation; Mr. Pat Spurgin, director, high level nuclear waste office, State of Utah; and Stephen A. Frischman, who is director, nuclear waste programs office of Texas.

Gentlemen, in view of our regrettable time constraints, I am going to have to do something that I always regret, knowing how much trouble you have gone to to prepare to be here, and the distance you have traveled to do it, and ask you to summarize your statement in 5 minutes. In this case, I will be watching the clock, and I will be informing you when your 5 minutes are up. I am always embarrassed to have to do this, but that is the way things seem to develop down here.

I am going, as I face the table, from right to left, so I am going to start with Mr. Wilson. As I said earlier, we are particularly glad you are here from the State of Vermont.

STATEMENT OF LEONARD WILSON, SECRETARY FOR ENVIRONMENTAL CONSERVATION, STATE OF VERMONT

Mr. WILSON. Thank you, Mr. Chairman.

For the record, I am Leonard Wilson, secretary of the agency for environmental conservation for the State of Vermont. I greatly appreciate this opportunity, Mr. Chairman, to expand on testimony that Governor Kunin gave to this committee in Montpelier, VT. She did speak to this subject, and I will not repeat her remarks because they were in the record. She addressed the rural area problem and the transportation question. I do want to talk to the major concern that we have in Vermont.

Governor Kunin, in that testimony, challenged the scientific validity of the basic assumption underlying this crystalline rock project, that is the conjecture that rock formations affording safe retention of nuclear waste actually exist. Governor Kunin also proposed that Congress take another look at the repository search process. She requested reconsideration of the question of scientific validity of the project, along with a thorough review of DOE procedures.

In my very brief remarks, I will expand only on the question of the scientific assumptions.

Governor Kunin wrote to Secretary Harrington of DOE on April 30 of this year to express her fundamental objection to the basic assumption that rock formations exist in the East that are appropriate for safe nuclear waste storage.

Crystalline rock formations are typically brittle and fractured, and contain ground water, often under artesian conditions.

Under EPA regulations, the site must have the capability of isolating radioactive materials for 10,000 years. A site in a wet climate, like that of the east, must be virtually impermeable therefore. Does a rock formation exist in the eastern United States in which a 2,000-acre chamber could be excavated that could be impermeable? That is a question one would have thought would have been extensively researched before this project was launched.

In her letter to Secretary Harrington, Governor Kunin concludes "the probability of locating a rock formation has not been scientifically established to my knowledge. Therefore, the site search proceeds either on false assurances of intended safety, or indefensible prospects of successful conclusion."

The Department of Energy reply was signed by Ben Rusche, to whom Secretary Harrington referred the Governor's letter, and this letter and the Governor's letter to Secretary Harrington are included with my written testimony, Mr. Chairman.

Mr. Rusche devotes one paragraph to this critical question, and he says the obvious. A site will be judged unsuitable if found to have fracturing at repository depth that would result in its failure to meet performance requirements. That is all he says. He does not respond to the issue of the fundamental scientific credibility of the conjecture that the rock formation exists in which the performance requirements can be met.

We find no reassurance in the silence of the Department of Energy on this critical issue. We remain persuaded that the repository search is based on a hypothesis, an untested speculation that a crystalline rock formation exists in which high level radioactive waste can be safely contained for 10,000 years.

The long-term stakes for humanity, to say nothing of the multimillion dollar cost of this project, argue for an intensive and comprehensive reevaluation of the premises and procedures of the crystalline rock project. We urge that the Congress undertake such a study.

Thank you, Mr. Chairman.

Senator STAFFORD. Thank you very much, Leonard, and thank you for staying within the 5-minute limit.

Gentlemen, it might be helpful for you to use the stop-and-go system here, if we can get it operating. You will have 5 minutes on the green, and after that you are running a red light.

Mr. Tousley, we will hear you next.

STATEMENT OF DEAN TOUSLEY, ATTORNEY FOR THE YAKIMA INDIAN NATION

Mr. TOUSLEY. Thank you very much, Mr. Chairman.

My name is Dean Tousley, and I am an attorney for the Yakima Indian Nation of Washington State. I have submitted a written statement by Mr. Melvin Sampson, vice chairman of the Yakima Tribal Council, which I requested to be included in the record of this hearing.

Senator STAFFORD. Without objection, we will include it.

Mr. TOUSLEY. I will summarize the highlights of that statement on the tribe's behalf. My testimony will address four aspects of NWPA implementation.

No 1, DOE intends to make the preliminary determination of suitability required by section 114(f) of the NWPA at the time that it recommends the three sites to the President for characterization. We strongly feel that the prelininary determination must come at or near the end of the site characterization in order to have any substantive significance and to comply with the natural meaning of the law and the National Environmental Policy Act.

Under DOE's interpretation, the EIS which DOE submits with its application for a construction authorization might consider as alternatives sites which are known at the time, as a result of characterization, to be unsuitable for development as repositories. As NEPA requires considerable of viable alternatives, such an EIS would be excellent grist for successful lawsuits.

Delaying the preliminary determination until after characterization as the law requires would provide DOE with much needed incentive to select for characterization the best possible sites.

No. 2, the program schedule. The Yakima Nation supports the need for continuing progress toward safe disposal of high level radioactive waste, although we are very concerned about DOE's apparent inclination to elevate the schedule above all else. Although virtually every deadline at the front end of the schedule has been missed, and generally for good cause, we believe, DOE refuses to concede the obvious fact that the ultimate deadline of repository operation by 1998 might also need to be relaxed.

The only way that deadline could still be met is by severely cutting corners in site characterization and the NRC licensing process. This schedule pressure would have serious negative effects on both the technical quality of the program and the institutional aspects, that is, licensing interaction with NRC and meaningful consultation and cooperation with the States and Indian tribes.

Because of the pressure from that unrealistic deadline, DOE is planning on unacceptably short periods for both characterization testing and NRC licensing. Both the USGS and the NRC have expressed their concern about these scheduling matters.

No. 3, defense wastes. The mission plan treatment of the disposal of existing defense wastes states that "readily retrievable liquid wastes at Hanford will be solidified and disposed of in the repository." It does not explain that DOE views the overwhelming majority of the existing defense wastes at Hanford which constitutes 60 percent by volume of the Nation's total inventory, to be "not readily retrievable," and somehow not subject to the requirement of disposal in a repository.

The mission plan does not explain DOE's legal authority to dispose of these wastes other than in a repository, nor does it even mention the implications for the repository in terms of size, loading schedule, or design, or for the transportation system if this waste does have to be disposed of in the repository.

No. 4, first repository site selection. The selection of an appropriate site for repositories is by far the most crucial aspect of this program. Congress recognized the importance of siting when it required the detailed geologic consideration should be the primary criteria for the selection of sites.

Unfortunately, DOE's program has followed neither the letter nor the spirit of this requirement as shown by both the mission plan and three key aspects of DOE's draft environmental assessment.

First, the potentially acceptable sites for the first repository were not selected on the basis of geologic considerations. Two of the nine sites, Hanford and the Nevada test site, were initially selected on the basis of land use, that is, because they are on Federal lands. Numerous respected scientific sources have expressed the view that the Hanford site, at least, would never have been selected on the basis of geologic suitability.

Second, DOE reaches apperently incorrect conclusions on many of the individual siting guidelines. For example, for the crucial hydrologic characteristic of ground water travel time, DOE has made several faulty assumptions in its Hanford EA, which resulted in travel times that are higher by a factor of 20 or more than should be the case. DOE has informed us that it does not anticipate changing the conclusions for the geohydrologic guidelines in the final EA, so this comment, apparently, remains valid for that document.

Third, because of numerous methodological quirks, the draft EA's do not include a reasonable comparative evaluation of the sites as required by the NWPA I will just refer to my written statement for elaboration on that point.

Senator STAFFORD. Without objection, your entire written statement will be in the record, as will all of the witnesses who are here.

We are going to have to break here for another rollcall. But as soon as I can return, Mr. Spurgin, we will hear you. I think that we can complete this panel by 1:30.

Mr. TOUSLEY. Thank you, Mr. Chairman.

Senator STAFFORD. I will go over and vote and be back just as fast as I can.

[Recess.]

Senator STAFFORD. The committee will please come to order.

Mr. Spurgin, we would be very happy to hear from you. We hope that we will be able to complete this panel without another rollcall.

STATEMENT OF PAT SPURGIN, DIRECTOR, HIGH-LEVEL NUCLEAR WASTE OFFICE, STATE OF UTAH

Mr. SPURGIN. Thank you, Mr. Chairman.

My name is Pat Spurgin, and I am the director of the State of Utah High-Level Nuclear Waste Office, and I do hope to keep these remarks to a very brief interval.

I have submitted written testimony, and I trust that it will be included in the record.

Senator STAFFORD. Yes; in each case, I won't repeat, but for the rest of the hearings this afternoon, written statements that have been furnished will be placed into the record.

Mr. SPURGIN. Thank you, Mr. Chairman.

Utah's Governor Bangerter has communicated to the President his opposition to further consideration of Utah sites as potential repository sites under the Nuclear Waste Management Program. Because the Department of Energy's mission plan accepts and perpetuates the conditions which lead to Governor Bangerter's opposition, that document is also objectionable.

The State has two basic concerns with the Nuclear Waste Program: First, the process as it has been structured by the Department allows for value judgments which may produce siting decisions which are inconsistent with the congressional intent to underlying the Nuclear Waste Policy Act and the laws which bear on its implementation.

A good example of this problem is presented by the decision-aiding methodology which has recently been developed by the Department and which will provide the basis for the Department's site characterization recommendation decisions. Through the methodology, the Department reserves to itself broad discretion in determining desirability of a site with respect to a particular siting criteria.

The methodology contains a similar reservation of discretion with regard to the weight ascribed to technical criteria in the determination of overall site desirability.

One may accept, for the sake of argument, that the Department of Energy must exercise considerable discretion in making judgments on the basis of an information base which can only be perfected through site characterization.

In other cases, there is a danger that congressional policy may be supplanted by the values of the administrators charged with implementing the Nuclear Waste Program.

For example, the Nuclear Waste Policy Act requires the Department to specify factors pertaining to proximity to national parks, which will cause a site to be disqualified from further consideration for a repository. The Department developed a siting criterion which mandates the disqualification of a site in proximity to a park if the presence of the repository of the site would irreconciliably conflict with park purposes.

The DOE has reserved to itself a judgment as to whether there is an irreconciliable conflict. Irreconciliability, in this context, is clearly a question of values, as is the determination of the weight to be given to impacts not deemed by the Department to be irreconciliable. But Congress has established the park system and the values it protects through the exercise of its legislative authority. Consequently, there is a danger that the legislated national policies may be sacrificed by value judgments made by DOE officials in implementing the Nuclear Waste Policy Act.

A similar type of concern is reflected in the letter report resulting from the National Research Council's review of the decision-aiding methodology. The council noted that translating broadly-worded guideline provisions into precise mathematical quantities for purposes of applying the methodology may lead to implicit value judgments that DOE is not prepared to defend.

The State's second fundamental concern is related to the amount of data collected and the nature of data analysis performed in support of site nomination and recommendation decisions. Site characterization studies represent a multimillion-dollar investment in the conclusion that a site is suitable for further study. As a general proposition, it will be prudent to assure that any gamble contained in a site characterization recommendation decision be minimized to the extent practicable.

In the case of Utah, a decision to characterize a site would be based on scant geologic data. Furthermore, sites under consideration in Utah are located in an area which is very fragile in terms of potential environmental and socioeconomic impacts. Site characterization studies, by themselves, could have dramatic impacts in these areas, and those impacts would be compounded by repository development.

State opposition to further consideration of Utah sites and to acceptance of the mission plan is based, in part, on the perception that the risk to the environment and the well being of the State's citizens posed by current levels of uncertainty is much too high. The mission plan perpetuates this uncertainty.

We do not believe that it is impossible to identify acceptable sites for a repository, given sufficient time to enable careful and faithful compliance with the Nuclear Waste Policy Act and related laws.

We will cooperate in all efforts to meet such an objective, but we do not believe that the current program is headed in that direction.

This concludes my statement.

Thank you, Mr. Chairman.

Senator STAFFORD. Thank you, Mr. Spurgin.

Mr. Bishop, we would be very happy to hear from you.

STATEMENT OF WARREN BISHOP, CHAIRMAN, STATE OF WASHINGTON NUCLEAR WASTE BOARD

Mr. BISHOP. Chairman Stafford and members of the committee, my name is Warren Bishop. I am chairman of the State of Washington Nuclear Waste Board, which is the policy group responsible for high-level nuclear waste disposal programs.

My testimony will focus on major State of Washington concerns about Department of Energy implementation of the Nuclear Waste Policy Act.

First, ranking methods and their implementation. On August 1, Governor Gardner, in testimony before a subcommittee of the House Committee on Energy and Commerce, recommended a pause in the head-long rush to site a repository and proposed that an independent panel of non-DOE experts be asked to examine the adequacy of environmental assessment data and conduct a new comparative analysis of sites.

DOE recently agreed to a portion of Governor Gardner's recommendation. The National Academy of Sciences was requested to review the proposed ranking methodology to be used in the final environmental assessment. The Academy's board of radioactive waste management responded to DOE's request on October 11. Although the Academy board concluded that the concerns which it had earlier expressed regarding the methods used for ranking sites described in the draft environmental assessment had been addressed, it emphasized that an opportunity was not provided to the Academy to examine the specific implementation and the proposed technique, including weighting factors, criteria for scoring, and procedures for selecting panels of technical experts, and the DOE decisionmakers.

We concur with the Academy that credibility of post-closure performance analysis would be substantially enhanced if the analysis were conducted by an independent panel of outside experts.

We will continue to insist on an extension of DOE's schedule so non-Department experts can examine the adequacy of data, conduct a new evaluation as to whether sites under consideration are suitable for site characterization and make a new comparative evaluation of the sites, sites still under consideration.

In this regard, Mr. Chairman, I was pleased to hear this morning Mr. Rusche's recognition of the importance of the delaying this important step in the process.

The second issue: preliminary determination of suitability. On September 6, Governor Gardner presented his views to the Nuclear Regulatory Commission on the importance and timing of the preliminary determination of suitability of potentially high-level waste repositories.

He clearly and forcefully testified that the act requires that a preliminary determination of suitability be made after characterization is substantially complete. The Nuclear Regulatory Commission concurrence with the DOE siting guidelines, included a provision that the determination be made after characterization.

In the final mission plan, DOE stated that the determination will be made before characterization. We strongly disagree with this reversal.

Third, defense wastes continue to be the major State of Washington issue. The Hanford Nuclear Preservation has played a key role in this Nation's defense effort, but we in the State of Washington, are now faced with a massive legacy of temporarily stored nuclear defense wastes. Wastes from defense activities have been building for over 40 years. Hanford now has the world's largest accumulation of nuclear waste. Nearly 60 percent by volume of this Nation's high-level nuclear defense wastes is at Hanford.

Senator STAFFORD. May I interrupt and inquire what the volume is? Could you tell us?

Mr. BISHOP. It is about 60 percent of the total volume, and I can't precisely tell you what that volume is. It is a considerable amount.

Senator STAFFORD. All right.

Mr. BISHOP. I can provide that information to you.

Senator STAFFORD. If you would, we would appreciate it.

[The information requested by Senator Stafford follows:]

JOHN SPELLMAN
Governor

WARREN A. BISHOP
Chair

STATE OF WASHINGTON
NUCLEAR WASTE BOARD
Mail Stop PV-11 • Olympia, Washington 98504 • (206) 459-6670

December 12, 1985

The Honorable Robert T. Stafford
133 Hart Senate Office Building
Washington, D.C. 20510

Dear Senator Stafford:

During my October 30 testimony before your Committee on Environment and Public Works, you asked me how much defense waste is stored at Hanford. I did not have the specific information available, but I promised to send you the information.

Enclosed is the information you requested. Table 1 gives the volume and radioactivity of defense waste stored at Hanford. Table 2 shows the volume and radioactivity of each type of waste in storage. Table 3 shows the type of wastes stored in the 149 single-shell tanks and the 20 double-shell tanks.

The tables are from a draft Nuclear Waste Board Focus Paper titled "The Defense Waste Issue For Washington State". The paper describes the history of defense waste at Hanford, how it is produced, how much there is, what it looks like, and how it is stored. I hope this report will be of interest to you.

Please call me at (206) 459-6670 if you have questions on the tables or the report.

Sincerely,

Warren A. Bishop

Warren A. Bishop, Chair
Nuclear Waste Board

WAB:blt

Enclosure

Table 1. Types of Defense Waste Stored at Hanford (1983)

	High-Level	Low-Level	Transuranics	Total
Volume (in millions of gallons)	53.6	83.7	27.7	165.0
Radioactivity (in millions of curies)	474.2	5.04	.05771 1/	479.30

1/ alpha radioactivity only.

Source: USDOE 1984a

Table 2. High-Level Defense Waste Stored at Hanford (1983)

	Liquid	Sludge	Salt Cake	Slurry	Capsules	Total
Volume (in millions of gallons)	15.1	12.4	25.0	1.1	0.0013	53.6
Radioactivity (in millions of curies)	33.0	143.3	14.4	0.22	283.3	474.2

Source: USDOE 1984a

Table 3. High-Level Waste Storage Tank Inventory at Hanford (USDOE, 1984b)

	No. of Tanks	Waste Volumes (gallons)						
		Salt Cake	Sludge	Supernate	Slurry	Total Solids	Interstitial Liquid	Pumpable Liquid
Single Shell Tanks	149	24,560,000	12,171,000	884,000	-0-	37,615,000	6,781,000	6,063,000
Double Shell Tanks	20	306,000	175,000	12,837,000	1,078,000	14,396,000	78,000	12,869,000
TOTALS	169	24,866,000	12,346,000	13,721,000	1,078,000	52,011,000	6,859,000	18,932,000

Mr. BISHOP. President Reagan has decided that it is appropriate to comingle defense and commercial high-level wastes in one repository. We agree with this decision.

However, we strongly disagree with DOE's plan to process only a portion of Hanford's high-level nuclear waste. The mission plan ignored the fate of high-level wastes stored in 149 older, leaky, single-shell tanks. These high-level wastes are made up of soluble salts, sludge, and residual liquids.

We are not convinced that leaving large amounts of high-level defense wastes in the ground at Hanford is the safest thing to do.

Fourth, the issue of liability. Congress must, with dispatch, address the problems of liability in compensation for damages and injury arising from disposal of high-level waste under the Nnuclear Waste Policy Act. It is Governor Gardner's and the nuclear waste board's position that Congress should be guided by the following cornerstones for all high-level nuclear waste incidents.

Senator STAFFORD. Could you summarize, in about 1 minute, your presentation?

Mr. BISHOP. Yes, I will.

If I could outline these four, the rest of my testimony is in the report.

Senator STAFFORD. Sure.

Mr. BISHOP. Strict and absolute Federal liability without regard to fault. Full compensation should be provided regardless of fault, to all victims of high-level nuclear waste incidents.

A program free of redtape should be established that provides for victims to be compensationed for all losses expeditiously and without any undue burdens. States and other entities should be held harmless from any liability that they might otherwise incur through any incidental involvement.

Thank you.

Senator STAFFORD. Thank you very much, Mr. Bishop.

Mr. Frishman, we would be glad to hear from you.

STATEMENT OF STEVE FRISHMAN, DIRECTOR, TEXAS NUCLEAR WASTE PROGRAMS OFFICE

Mr. FRISHMAN. Thank you, Mr. Chairman.

I appreciate the opportunity to be here, and I think you will see from my written testimony that I would appreciate including in the record that I have covered many of the same issues that we have heard discussed here today.

First, I would like to just remark that if you look at my written testimony, you will see that I am considerably gratified by the request from Senator Moynihan this morning to the Nuclear Regulatory Commission to consider the impact ultimately on protection of public health and safety by adherence to the 1998 deadline in the act. This is something that I and the State of Texas and other States have been very concerned about, and I think it should be recognized that in that request, new ground is being broken, because in looking at at least the early discussions that the Commission members have had regarding preliminary determination of suitability, they, as a majority, tend to move toward leaving interpretation to Congress, and I think it is important that they are requested to provide their opinions from this body so that then Congress can review a full spectrum of opinion.

I am going to change my approach that I normally take in such hearings and speak about things very specific to Texas, since all the rest of it is in my written testimony.

Of great concern to us is the issue of protection of ground water relative especially to the sites in Texas that are underlain by portions of the most significant aquifer in the Nation. It is further significant that the site is preferred by the Department of Energy as one of the three for characterization.

The EPA rule has gone through a long evolution, even after the close of the public comment period. That long evolution involved a number of working papers that were specifically stated to be for internal use, and that evolution also included a continuing set of interactions between the EPA and the Department of Energy in finalizing that rule.

The final rule has introduced ground water protection requirements that, from our point of view, take excessive liberties with the application of these requirements to the extent that they appear to not apply to the valuable and limited waters of two aquifers that I just mentioned, the Ogallala aquifer and the Santa Rosa aquifer.

You raised a question earlier about the high probability that the ground water classification contained in the EPA ground water strategy probably does not apply to rural waters, especially those that are pumped at individually owned supply wells.

I think that point has been well established, and we have great concern with even considering using that classification in this rule for that purpose.

Then the qualification of the definition to thousands of persons is really a bold unsupportable contradiction of the intent of the Safe Drinking Water Act. This act has been some-what enthusiastically moved toward reauthorization just very recently by both Houses of Congress.

The act itself seeks to have supply systems included for protection that serve as few as 15 connections, and 25 persons. Yet we find interestingly enough, that the thousands of persons standard seems to have resulted from DOE's negotiations with EPA over this final rule.

That emerges from the minutes of one of their meetings where the synopsis or the summary of one of their comments to the EPA states that the risk levels based on large population assumptions—and this is in reference to EPA interim drinking water standards—are inappropriately applied to low population and intrusion scenarios.

The interim drinking water standards are intended for application at the minimum levels that I have just stated, and DOE is here inappropriately attempting to reinterpret those rules in the Safe Drinking Water Act for its singular purpose of protecting sites within its list of sites that they have under consideration.

Another objection that they made in the same set of comments in the negotiations, and we have yet to see the impact of it, but I think we can sense the impact; the objection is stated as follows: "Difficult to demonstrate compliance analytically—Predictive uncertainties highest during the first thousand years during which requirements apply."

This gives us no confidence in DOE's assurances that the irreplaceable ground water in the vicinity of Texas sites can be protected and makes us more reassured that those sites and vicinities should not even be considered as sites.

The DOE incorporated the EPA rule into its guidelines for recommendations of sites, based upon the early assumption that the final rule will be substantially the same as that proposed in 1982, although this didn't turn out to be so——

Senator STAFFORD. Mr. Frishman, could you summarize in about 1 minute?

Mr. FRISHMAN. Yes, I will finish up.

And also EPA afforded the opportunity to DOE to, in a very unique, procedural way, influence the substance of the final rule. Two big questions come to mind for us: One of them is, Does the EPA rule adequately protect the environment based upon objective conservative standards, or does the rule simply serve to protect the continued viability of DOE's potential candidate sites?

And the second, does the EPA rule, in conjunction with the DOE site recommendation guidelines, provide the Secretary with the basis to meet the requirements of section 124 of the Nuclear Waste Policy Act which speaks to giving full consideration to impacts of water rights and whether those impacts can be maximally mitigated?

We don't, in either case, think that the act is being complied with.

Thank you.

Senator STAFFORD. Thank you, Mr. Frishman.

Mr. Green, we would be glad now to hear you as the cleanup witness, I guess, for this panel.

STATEMENT OF JOHN W. GREEN, JR., INTERIM DIRECTOR, MISSISSIPPI DEPARTMENT OF ENERGY AND TRANSPORTATION

Mr. GREEN. Thank you, sir.

I am John W. Green, interim executive director of the Mississippi Energy Department of Transportation, and I appreciate the opportunity, Mr. Chairman, to appear before you today to present a statement on behalf of the State of Mississippi regarding DOE's Nuclear Waste Program.

I also appreciate having the written testimony made a matter of the record because we down South tend to talk a little slower than some of the rest of the other witnesses.

The Mission plan has been formerly submitted to the Congress by the DOE as the document by which DOE will attempt to implement the Nuclear Waste Policy Act of 1982. Yet, I do not believe this document accurately indicates the current state of the High Level Radioactive Waste Program, nor does it provide an information basis sufficient to permit informed decisions to be made.

One of the greatest areas of concern to us in Mississippi and one that we feel has not received credible attention is the socioeconomic impacts of the DOE program in the past as well as the anticipated impacts in the event that a repository is constructed.

The mission plan deals extensively with geologic, hydrologic geochemical, and gomechanical research, but no similar research in socioeconomics is mentioned.

This is justified by saying it is difficult for socioeconomists to make accurate assessments for periods covering 80 years or more.

However, the fact is that physical scientists are also having difficulty proposing what kind of disposal DOE can contain in high-level waste without leakage over a much shorter period of time.

Also of great concern to Mississippians regarding socioeconomic impacts is the extent of impacts already realized in our State and primarily the areas proximal to the repository sites under consideration.

Mississippi has repeatedly requested funding to conduct a socioeconomic evaluation of the areas surrounding the two salt domes under consideration for a repository in order to determine the scope and extent to which the citizens have been affected by the DOE activities.

Our requests have been to gather data about conditions which might exist in the future during site characterization or construction or operation of the repository. We simply sought adequate funding to find out what has happened to date. The Department has granted awards to other of our sister States, we understand, approved to request socioeconomic studies in other areas where the direct impacts upon people did not exist. Even our most recent attempt at a meeting in Mississippi on October 21, 1985, to obtain funds from DOE to perform this, what we feel is a much-needed study. DOE officials finally acknowledged that our request may not be unreasonable and agreed to sit down and consult with us on it, only to return to Washington and a day or two later, someone called to say that the present level of funding was adequate and there would not be any more.

This was done without consultation. The Richton, MS, site is the only site in the first round that has people, residential dwellings and other structures and a portion of the town itself physically situated over the geologic feature in which DOE is considering for a respository. This is the reason that socioeconomic impacts are of such great concern to my State.

Our people may become threatened and endangered species. A topic of considerable concern to all with whom I have come in contact in this program is the provision in the Nuclear Waste Policy Act for consultation and cooperation. We have always believed that the Congress intended that consultation be a two-way flow of information in the form of deliberation.

However, the Department of Energy has not applied this definition to the process. The States and tribes are drawn into the process in and after-the-fact review and comment mode.

A prime example of this lack of consultation and cooperation is poor trade in the development and implementation of the methodology for ranking sites. Mississippi and our sister States were told we would actually help develop the scientific criteria and methodology for site selection and ranking. This promise was never kept. The States and tribes had the opportunity to create at least two of the preliminary drafts of only four of the seven chapters prior to the publishing in December 1984 of the draft environmental assessments.

When the States asked to review the other three chapters which contained the information on the site selection and ranking, the Department flatly refused. On November 2, 1984, the DOE headquarters office announced that they had internally agreed upon a methodology for ranking the sites.

The DOE offered to conduct a meeting in Washington to explain this methodology. DOE refused to allow the States to review and critique these chapters as had been done in the past.

Thus, we were refused the opportunity to aid, in any way, develop the ranking methodology. This is not the only example of the lack of consultation that is declared anymore. With that, I will conclude my comments and thank you very much.

Senator STAFFORD. All right, thank you very much, Mr. Green. Thank you all. If you will remain just a minute, Mr. Rusche has been kind enough to stand by. I am not attempting to start a debate at this point, but Mr. Rusche, are you at a point to respond to any questions or concerns that this panel has raised?

We would appreciate it if you would rather forebear, why, we understand that.

Mr. RUSCHE. I would be delighted, Mr. Chairman, to have a chance to react to your questions or make a general comment.

Senator STAFFORD. I think a general comment might be a good idea, if you could do that.

Mr. RUSCHE. Mr. Chairman, it is obvious from the comments made by our cooperators and consulters, and so forth, in the States that we have not yet reached the state of conversion that we all would like to strive for.

I think that this comes as no surprise to me. Each of these gentlemen and I have had opportunities to talk on a number of occasions before. I would readily acknowledge that we probably have not been as effective as we would like to be. I rather suspect, though, that we have different objectives and so long as the objectives remain different, I suspect that we are going to find bases for displeasure with the conduct of DOE.

That does not mean that we have any less regard for it or any less obligation to try, and we will continue to try.

I would note a couple of things, if I may?

Senator STAFFORD. Certainly.

Mr. RUSCHE. We have taken a number of the substantial extra steps which, as based on these comments, still have been less than adequate, but with respect to the development of the guidelines, which occurred before I was appointed by the President. In large measure, there was considerable additional time taken by the Department to involve members of the States and affected Indian tribes and the public.

In fact, instead of 6 months, a year and 6 months was taken.

The product varies, depending on who you talk to. The Commission concurred. We believe the guidelines are an effective basis for the siting process. Some of these gentlemen and their colleagues think that in spite of the additional time, that their views were not fully considered or preliminarily were not included.

With respect to the environmental assessments for the selection of sites, we did elect, beyond that required by the act, to publish the assessments in draft form; have taken an additional year beyond that prescribed by the act for the very purpose of obtaining input and consultation. Apparently, that forum is not as well received as some other forums, as you have heard mentioned this morning.

Nevertheless, it did produce 20,000 or more comments which have been, in large measure, constructive in permitting us to provide final environmental assessments, as I discussed this morning earlier, which we believe do meet the intent of the act, do conform with the regulatory and legal requirements, and I believe will provide a sound basis for making the choice of three sites of the characterization and the nomination of five as suitable for characterization.

All of this does not remove the differences of views that exist. It causes me to pledge to you and the Members of Congress additional resolve that we will continue to work toward such agreements and understandings and will be more tolerable.

I think I have removed or I have had removed from my prospects the thought that we will ever find a happy working relationship. I think so long as our objectives remain different, and I believe they are different, then we are going to find an element of tension, and perhaps that is not unwise, as Congress wisely put it.

We are committed to negotiating consultation and cooperation agreements as required by the act. Only one State has taken initiative in advance of their designation as a site for characterization, and if we moved down the course that we are on now, by early spring, we should be in that mode, and by summertime, we should be able to come back to you and either have negotiated such agreements, or both of us, as parties, will come to the table and tell you we have been unable to reach such an agreement.

I have gotten reports from various Governors and their States and legislatures that involve the likelihood of that prospect. I will decline to report those on the grounds that where there is hope, we will keep on working at it. And I believe there is hope that we can work out such an agreement.

I do value their statements. I believe each of them has spoken out of the best of intent and the interest for their constituents and their States, and I am pledging to you that we will do our very best to continue to work with them and to carry out the act to the best of our ability.

Senator STAFFORD. Thank you very much, Mr. Rusche.

I think now we will conclude this panel, and we appreciate your additional comments, which I am sure the panelists were glad to hear. We thank you all very much.

Gentlemen, there may be some questions in writing, if that is agreeable, since other members of the committee weren't able to be here this afternoon. I am going to give the remaining panelists an opportunity for a choice.

Mr. Behnke, Mrs. Anderson, Dorothy Cole, and Delbert Devin, if you are here, we would give you the choice of either doing it right now or adjourning until 2:30. If you want to get this done, we will do it now.

Mr. Behnke, if you will come forward, we will assume you are willing to conclude this now.

The chance of interruption gets greater and greater as the afternoon goes on, so we do have a better prospect of being able to hear witnesses without interruption now.

Is Miss Anderson here?

Ms. **ANDERSON**. Yes, I am here.

Senator **STAFFORD**. All right. Dorothy Cole and Delbert Devin, are you here? All right, you go right ahead, Mr. Behnke.

STATEMENT OF WALLACE B. BEHNKE, VICE CHAIRMAN, COMMONWEALTH EDISON CO.

Senator **STAFFORD**. Proceed: Did I pronounce your name correctly, Mr. Behnke?

Mr. **BEHNKE**. You did that.

Senator **STAFFORD**. And you are the vice chairman of Commonwealth Edison?

You may proceed.

Mr. **BEHNKE**. Thank you very much, Senator.

I appreciate more than I can say your willingness to take me on on this short schedule. I am pleased to have this privilege to appear before you today and on behalf of the Department of Energy's implementation of the Nuclear Waste Policy Act of 1982.

As you indicated, my name is Wallace B. Behnke, and I am vice chairman of the Commonwealth Edison Co. I would request that my written statement, which has been distributed to the committee, and which I will summarize, be included in the record of this hearing.

Senator **STAFFORD**. Without objection, it will be.

Mr. **BEHNKE**. Thank you very much, Senator.

The success of the DOE's commercial nuclear waste program is vital to the Nation's 121 nuclear powered units. Nuclear power utilities presently fund the waste program at an annual rate of approximately $350 million by way of the 1 mill kilowatt-hour fee. The nuclear utilities and their electricity customers bear the cost of this program and are commited to help to assure a successful, timely, and cost-effective implementation.

While DOE's final mission plan sets forth a credible blueprint for the nuclear waste program, there are, in our opinion, serious implementions issues still to be resolved.

An essential and virtually unprecedented aspect of the nuclear Waste Policy Act is the details schedules with mandated deadlines for Federal agency accomplishment for the act's requirements. The act requires the Secretary of Energy to prepare a project decision schedule that portrays the optimum way to obtain the operation of the repository involved with the final period specified.

The Secretary is also to report to Congress any Federal agency's failure to comply with the scheduled deadlines.

DOE's compliance with this aspect of the Nuclear Waste Policy Act continues to be disappointing. We respectfully suggest that this committee encourage DOE to comply as closely as possible with the schedules established by Congress and to set forth the optimum means of compliance with its projection decision schedule.

Further, DOE must report not only schedule problems of other Federal agencies, but also those of its own making. We are greatly concerned that DOE listed the required January 1, 1985, date for recommending three candidate sites to the President for characterization. There is now a critical need for DOE to complete this action and get on with site characterization.

We are also concerned that DOE has yet to establish a systematic program for controlling the cost of this multibillion-dollar program that will continue for many decades.

DOE should establish increased management control and physical accountability for the waste management program including: Centralized management for strategic planning; guidance, physical, and schedule control; systematic and continuing audits of the program contractors and subcontractors as suggested by the GAO; and clear and specific guidelines to grant applications by States and Indian tribes.

The President has determined that high-level radioactive waste results from atomic energy defense activities should be commingled with civilian spent fuel and waste in the geologic repositories. We submit that an appropriate cost evaluation approach for commercial and defense waste should be based on the primary characteristic DOE used to justify commingling defense and civilian waste, and that is, simply cost savings.

The cost savings resulting from combined operation should be shared in proportion to the cost estimate for separate waste facilities.

We describe this approach in more detail in attachment A to our written statement.

We respectfully request that this committee urge DOE to pursue an open process that would include utility input and ensure development of an equitable allocation formula.

The question was raised during NRC concurrence processes as to when the section 114(f) determination of site suitability must be made by DOE prior to, after completion, or at some time during site characterization.

We agree with the clear answer provided in the DOE mission plan. The determination is to be made at the time DOE recommends three sites to the President for characterization.

DOE's final mission plan assumes NRC licensing for construction authorization can be accomplished in 27 months. Because repository licensing falls directly on the critical path, we believe DOE must act now to establish an appropriately staffed licensing office and to resolve licensing issues with the NRC during the site characterization and facility design phases of the program.

NRC must adopt a flexible licensing strategy for repositories which we believe should include: Close coordination with DOE in the preapplication period; early establishment of acceptable technical criteria and standards in branch technical positions, regulatory guides, topical reports, or regulations; advanced licensing of standard waste package and surface handling facilities; a streamlined public hearing process; and preliminary sensing of a conservative operating phase.

We were pleased that the National Academy of Sciences Board on Radioactive Waste Management commended DOE for its adoption of a rigorous form of decision methodologies for selection of the repository site. We are troubled with the board's suggestion that an independent panel of outside experts review the complete analysis prior to issue of the final environmental assessments.

Such an independent review may unnecessarily delay issuance of the environmental assessments and the nomination of sites for characterization.

Finally, the August 1985 Environmental Projection Agency standards governing high-level waste disposal imposes extremely strict limits, a thousand times more stringent than those applied to other areas. The NRC's Advisory Committee on Reactor Safeguards is concerned that the quantitative probablistic analysis utilized in applying the standards will result in unnecessary licensing obstacles with minimal, if any, benefit to the public.

We share this concern and suggest that this committee will want to remain apprised of the resolution of this issue.

In conclusion, Mr. Chairman, we look to this committee and the Congress to provide continual oversight of DOE in its implementation of the Nuclear Waste Policy Act.

I thank you for this opportunity to present our views, and would be pleased to answer your questions at this time.

Senator STAFFORD. Thank you, Mr. Behnke. I think there may be questions from other members of the committee who can't be here this afternoon and from me in writing, if that might be agreeable to you?

Mr. BEHNKE. Mr. Chairman, that would be perfectly satisfactory with me and my colleagues and we would be glad to answer your questions. We will look forward to receiving them.

Senator STAFFORD. Thank you. You have a phrase in your short statement here which I think I shall appropriate with due credit to you and apply it sometimes to the U.S. Senate, especially this afternoon: A quantitative probablistic analysis. I am not sure what we come out with, but it is a phrase to describe what may be going on over there.

Mr. BEHNKE. Very good. Thank you very much, Senator.

Senator STAFFORD. Thank you very much.

Now, Commissioner Edwyna Anderson, public service commissioner, State of Michigan.

STATEMENT OF EDWYNA G. ANDERSON, COMMISSIONER, MICHIGAN PUBLIC SERVICE COMMISSION

Senator STAFFORD. Commissioner, we would be very happy to hear from you.

Ms. ANDERSON. Thank you very much, Senator Stafford.

I am Edwyna G. Anderson, commissioner of the Michigan Public Service Commission, and member of the National Association of Regulatory Utility Commissioners, commonly known as the NARUC. I am a member of its executive committee, a member of the Committee on Electricity and its Subcommittee on Nuclear Issues and chairperson of its Subcommittee on Nuclear Waste Disposal. I am testifying here today on behalf of the NARUC, a 96-year-old quasi-governmental organization of commissions engaged in the economic regulation of investor-owned utilities within the 50

States, the District of Columbia, Puerto Rico, and the Virgin Islands.

One of our responsibilities is to assure the Nation's ratepayers that all possible efforts are being made to make the nuclear waste disposal program safe, well managed, and cost effective.

We emphasize in keeping with our regulatory responsibilities, that all ratepayers of utilities operating nuclear electric plants are now being assessed through their monthly electric bills for this decades-long program costing billions of dollars. Ratepayers, not utilities, are the source of these revenues.

NARUC's review of, and conclusions on, the Department of Energy program are still under development and are expected to so continue in the foreseeable future.

The NARUC finds it important, however, to release these present observations of the program and its conduct in the hope of focusing attention on any necessary corrective action.

While our overall findings are spelled out in greater detail in 23 pages of written testimony, which I am requesting be bound into the written record, the NARUC wishes to single out today two of these issues for your consideration.

First, defense waste payments. Two offices within the DOE are negotiating, in camera, over an equitable formula and timing for these payments. This appears to be a clear conflict of interest. We are concerned that ratepayers, financial interests may not be adequately protected, and we have no assurances that the basis of the formula that will prorate costs between defense and civilian nuclear wastes will be correct.

We believe that the defense financial and program responsibilities should continue to the end of the entire program just as do ratepayer responsibilities and that they should be reviewed periodically.

We request the attention of the Congress to this matter to assure that the defense waste will be paid for on a fair, timely, and equitable basis.

We do not want electric ratepayers subsidizing the defense waste portion of the disposal program.

Second, we believe there is a need for oversight hearings to review program costs and their control. We note that the Congress has held hearings on siting, the mission plan, and other facets of the waste program. The NARUC is concerned about the cost of this program and the perception by some that infinite program revenues are available.

We are concerned that approximately 95 percent of the waste program's budget is spent by outside contractors with minimal amounts of auditing of expenditures by DOE or others. We note from often painful experience the contractor work and expense and the management control of contractors historically have been a source of nuclear generating plant construction problems. We believe that such concerns can be addressed in a hearing providing data and direction for more successful cost-effective Nuclear Waste Program.

In conclusion, we believe that the Congress should assist the DOE through a continuing and intensive oversight of this high-cost program, thereby contributing to the DOE's delivery to a conservative, predictable, and successful program, one that will conclude on a reasonably certain schedule; one that utilities can confidently employ in their planning; and one that ratepayers can believe is the cost-effective result of their funding.

The NARUC is very appreciative of this opportunity to address the Congress on this issue, and it is our duty and our pleasure to attempt to contribute to the strengthening of this difficult program.

We cannot, in the alternative, sit by and wait for the manifestly easy temporary solution, the raising of a nuclear waste fund fee.

Thank you very much.

Senator STAFFORD. Thank you very much, Ms. Anderson. You did it in less than five minutes. I think that I will award you the Calvin Coolidge award for brevity this afternoone

Ms. ANDERSON. Yup.

Senator STAFFORD. Come back in a month.

Ms. ANDERSON. Thank you.

Senator STAFFORD. There probably will be some questions in writing from committee members who aren't here this afternoon. Are you agreeable to respond to them in writing?

Ms. ANDERSON. Very much so. Thank you.

Senator STAFFORD. Thank you very much. We appreciate the time and effort you have gone to to be with us.

The last two witnesses will be in a panel, Dorothy Cole, president of the Perry County Citizens Against Nuclear Disposal, from Richton, MS, and Mr. Delbert Devin, president of Serious Texans Against Nuclear Dumping from Tulia, TX, if those two would come forward?

STATEMENT OF DOROTHY COLE, PRESIDENT, PERRY COUNTY CITIZENS AGAINST NUCLEAR DISPOSAL

Senator STAFFORD. I notice, President Cole, that you are accompanied by Bonnie Cole and Carolyn Blackman. If you would like to have them at the witness table, please do so. If you have no prearranged order of appearance, I would start, Dorothy Cole, with you, and you know that your full statements, which I have here, will be in the record. In your case, Dorothy, the attachments we will place in the record, also.

Ms. COLE. That is fine.

Senator STAFFORD. If you can summarize in 5 minutes, we appreciate it.

Ms. COLE. Thank you, Mr. Chairman. I am Dorothy Cole, president of the Perry County Citizens Against Nuclear Disposal. As you said, I have with me Bonnie Cole and Carolyn Blackman with me.

The Mississippi salt dome has been under investigation of the Department of Energy since 1976 as being a potential and acceptable site for development of a repository. Numerous questions have been raised by our citizens regarding the following statements: The proximity of the town of Richton; over 60 percent of the population of Mississippi within a 100-mile radius of the site; inability to assess the ground water flow around salt domes. The Mississippi gulf coast was not included in the impact area; contamination of ground water; storing of pile salt, a pile of salt 50 acres big, 100 stories high which would be exposed to hurricanes, floods, tornadoes, and include rain fall of 60 inches and more each year.

Forestry is our main economic base, and it is a renewable resource. It would be exposed to wind-blown salt that could devastate the vegetation all the way to the gulf; property values which can decline because of possible siting of the repository.

The Richton-owned site is the largest nearsite population of the 50 sites now being considered. In fact, there are people living on the dome. The total population within a 50- miles radius of 1 million people.

Consideration must be given to these facts prior to your nomination for site characterization. The Richton salt dome should not be chosen because of its size and its easy access which DOE has alluded to.

We feel that the DOE, NRC, EPA should be required to come to an agreement on what constitutes the accessability environment in the control area, including the degree of control that would be required for further, either site characterization or a repository. The anxieties of the indecisiveness of the Department of Energy and its predecessors have tormented citizens of the State of Mississippi.

There is absolutely no reason for us to have to be subjected to these, yet after hundreds of volumes of books and millions of dollars, the Department of Energy is still assuming the assessability requirement for our dome. Our Government has been less than candid with us as demonstrated by DOE's refusal to adhere to the provisions, consultations, and considerations set forth in the Nuclear Waste Policy Act, section 1176. Public access to a decision by an agency of the Federal Government is absolutely critical to the confidence in the Government's programs to develop appropriate technology for the disposal of nuclear waste.

Studies have been prepared to determine the markings that are needed for future generations. Most people today can't even read old English, which is 500 years old. We are not sure that someone would be able to read our 1985 language in 10,000 or 1,000 years from now, and we don't know if the geological exploration records would be available for people to see at that time.

We don't feel DOE has addressed that adequately.

The radiological risks which would result from direct external radiation emitted by radioactive wastes as shipments passed through the various areas; the total number of shipments of nuclear waste would be 9,000 by the year 2000—this is from DOE documents—and this would be about one truck per hour arriving at a repository.

For this reason, the repository site would become the end of the transportation funnel and vulnerability to possible transportation system bottleneck. The people near the site, for example, in Richton, would be exposed to greater radiation. This needs to be further addressed. Numerous studies have been conducted over the years by universities and other scientists, but DOE selectively omits and ignores other scientists' views on the waste problem.

The only information that they like to get is those generated by their very own contractors to conform to the guidelines.

A fatal flaw which permeates this program is the obvious conflict of interest among subcontractors. A contract of this magnitude would be tenaciously sought by the subcontractors. The more favorable a site can be portrayed by a firm, invariably, there will be contracts awarded to further investigates these sites. We remain vehemently opposed to the Richton dome as a nuclear repository based upon DOE's liberal and inherent uncertainties and the potential they use throughout the documents. There should be only site-specific data used. Off-site, generic, and state-of-the-art data are not adequate to endanger our public health.

Despite the submission of 2,100 plus comments which came from Mississippi alone, no substantial revisions have been made by DOE.

Senator STAFFORD. You have got about 1 minute to summarize.

Ms. COLE. OK.

This leads us to conclude that they don't want our comments. They just want to satisfy the law. The latest issue that we are concerned about is a possible revised methodology for the ranking of sites, and we feel like this is kind of like changing the horses in the middle of a stream.

I would like to thank you for the opportunity to be here today, and we request that you give careful attention to the matters that we have on our statement. There are attachments to it, and we will be happy to answer any questions that you might have in writing.

Senator STAFFORD. Thank you.

Ms. COLE. Thank you.

Senator STAFFORD. Mr. Devin, we are ready to hear from you.

STATEMENT OF DELBERT DEVIN, PRESIDENT, SERIOUS TEXANS AGAINST NUCLEAR DUMPING

Mr. DEVIN. Thank you, Mr. Chairman.

I was grateful that you are still here. This has been a long process, and I appreciate your staying. I am primarily appreciative of the remarks you made about common sense, because I am a farmer from Texas. I am speaking here from a sensitive group in Swisher County. I have been a farmer all my life with the exception of what time I spent in the service in the Far East as well as some time teaching at the University at Texas Tech.

I have farmed land within the site. I live adjacent to the site. My actual home is here. I am here also today representing the POWER organization from Herford, an organization of assistance groups made up of landowners within the site and others.

As I got the letter of invitation, I realize it is impossible in this short time to address all the issues you raise. I will mention just a few to give an overview of where we come from and the substance, the involvement in the Federal Government Nuclear Waste Program prior to the passage of the act.

We believe it is our responsibility and the responsibility of this Nation for present and future generations to require a careful, technologically sound solution to the nuclear waste key. Politically motivated decisions by the Department of Energy will never solve a problem of this gravity. We believe, as we believe about other issues at the national level, that we must have the best site, and anything less than the best site should not be acceptable to this

Nation, and certainly shouldn't be acceptable to those of us being affected.

Now, I want to talk about water and ground water, because that is where we make our living from. The site in Texas, as Mr. Frishman indicated, penetrate, if they are chosen would penetrate, the aquifer of the Ogallala which underlie parts of eight States. It also would penetrate the Santa Rosa aquifer, which is a deeper, larger aquifer.

I want to give you details about one particular well in that site. This well is at the Santa Rosa aquifer. It is the sole source for future supplies of the town of Benefit, about 1,000 people, so you will appreciate the size of our towns there.

Also, this well was drilled in 1977. Since that time, we are constantly using it. It has dropped 3 feet from the static water level. Last year, they produced 602 acre fields of water from this one well, and after doing that, we found the water had raised 1 foot. Evidently, recharge is taking place, despite the information that is being fed that the Ogallala is disappearing.

The Santa Rosa certainly is not disappearing, and we have reason to believe, based on the immense amount of water we have in our playa right now, because we have had about 1 foot of rain in the last month. We believe they have been recharging those lakes, and that is what our experts at the High Plains Underground Water District, Mr. Wayne Wyatt says:

> It is a basic idea of recharge. This idea of coming into prime farmland to penetrate the largest aquifer of the United States in a land that is 90 percent prime farmland in a county that is third in the Nation so far as value of agricultural products produced, to pick a site in that location, to me, is pure insanity.

I don't think any commonsense prevailed in this case, as a matter of fact, and I do believe that it should be looked at very carefully. I believe that we have a real problem here, but we have also a problem of providing for future generations for food, and here we are in the bread basket of America.

Ogallala lies in the bread basket, and if we should, by any chance, contaminate the food chain of that water, it would be totally insane. Even if the chance is remote.

The Department of Energy says we are going to drill through this by techniques that have never been used on aquifers of this size; we're going to freeze the aquifer and we are going to drill through it. Yet, we can find no evidence whatsoever that aquifers of this size that evidence has ever been produced. We believe this strictly will be research to be used at this time instead of proven technology.

I have said all these things. It sounds like I am also becoming very much parochial, and I guess I am. I had the privilege last July of meeting with a citizens' group from five of the first affected States, including the State of Minnesota for the second round. As I gathered with those people and we developed the statement of principle, I gathered all of us arrived at the same conclusion: And I think it is important. There we were. The State of Mississippi was there. I thought I might have problems with Mississippi, but I found out all of us were convinced the DOE program as it is being implemented at the present time is not doing us a favor.

I think the Congress should call upon the DOE to comply with the act. I think the act has all kinds of impossibilities. I think good implementation is needed. I found all the States, DOE had zero accountability in those States. The program cannot go out of it. I think the Senate must come to it. Senator, I want to thank you for staying with me and all these other people, and I thank you for this opportunity.

Thank you.

Senator STAFFORD. Thank you very much, Mr. Devin.

Mrs. Cole, I see your two accompanying ladies. I will allow them a brief comment each, if they had hoped to make one.

Ms. BONNIE COLE. Sir, I came here to Washington, DC, because in 1983, in Hattiesburg, MS, we were told that you can't say you don't want nuclear waste because someone in Washington had a big stick. I just wanted to come and see if you got a big stick, and also to tell you that we are adamantly opposed to the storage of nuclear waste in our area, and we resent highly the treatment that we have received from the Department of Energy thus far.

We have been spoken down to, laughed at, been called red necks, and, sir, I am not a red neck, because I worked out in the fields for many years. That's the way we made our living. I resent that kind of treatment to this great State.

Senator STAFFORD. All right, thank you.

Miss Blackman, did you have a statement?

Ms. BLACKMAN. There's a very important impact from the program that is not apparently being considered or addressed in that there are serious negative socioeconomic impacts occurring to date, specifically in my area, due to the fact that our town actually resides on the geologic formation.

We have evidence of those impacts in the attachment to Mrs. Cole's statement. I think it is important that we consider the fact that the Department of Energy has not broached any mechanism for modifying these effects or making preparation in the areas which are experiencing damage, and this needs to be considered. It should have been done long ago.

The net effect has been that our citizens have been forced to hold our lives in abeyance until some undesignated time in the future.

Senator STAFFORD. All right. Thank you all.

Once again, I will say there may be questions in writing from members of the committee. If that is agreeable to you, respond to them at your early convenience, and I appreciate your taking the time and trouble of being with us today.

Thank you very much.

With that, the committee will stand adjourned, subject to the call of the Chair.

[Whereupon, at 2:15 p.m., the committee was recessed, subject to the call of the Chair.]

[Statements submitted for the record follow:]

TESTIMONY OF
SENATOR PATRICK J. LEAHY
BEFORE THE
ENVIRONMENT AND PUBLIC WORKS COMMITTEE
ON THE NUCLEAR WASTE POLICY ACT OF 1982

OCTOBER 30, 1985

BEFORE I BEGIN TO DISCUSS MY VIEWS ON THE NUCLEAR WASTE POLICY ACT, I WANT TO THANK THE CHAIRMAN OF THE COMMITTEE, MY COLLEAGUE FROM VERMONT, BOB STAFFORD, FOR SCHEDULING THESE HEARINGS. AS HE KNOWS, THE DEPARTMENT OF ENERGY'S NUCLEAR WASTE PROGRAM HAS BEEN VERY CONTROVERSIAL IN VERMONT. HUNDREDS OF VERMONTERS HAVE TURNED OUT AT MEETINGS THROUGHOUT THE STATE ON THE DEPARTMENT'S PLANS.

IT WILL BE NO SURPRISE TO THE SENATORS HERE TODAY TO LEARN THAT MANY STRONG FEELINGS WERE EXPRESSED IN THOSE MEETINGS. BUT THOSE MEETINGS DID MUCH MORE THAN VENT FEELINGS. MANY OF THE SPEAKERS RAISED FUNDAMENTAL QUESTIONS ABOUT THE WISDOM AND FAIRNESS OF THE PRESENT RADIOACTIVE WASTE PROGRAM. THE CONCERNS RAISED BY THOSE VERMONTERS HAVE MADE IT CLEAR TO ME THAT THE NUCLEAR WASTE POLICY ACT NEEDS TO BE THOROUGHLY REVIEWED BY THE CONGRESS. TWO BROAD ISSUES NEED TO BE ADDRESSED.

FIRST, HAS THE DEPARTMENT OF ENERGY IMPLEMENTED THE NUCLEAR WASTE POLICY ACT AS CONGRESS INTENDED?

SECOND, DOES THE NUCLEAR WASTE POLICY ACT NEED TO BE FUNDAMENTALLY ALTERED?

I URGE THE COMMITTEE TO ADDRESS EACH OF THESE ISSUES. I HAVE COME TO THE CONCLUSION THAT THE ACT NEEDS TO BE FUNDAMENTALLY ALTERED AND THAT THE DEPARTMENT HAS NOT IMPLEMENTED THE EXISTING ACT IN A MANNER THAT SHOULD BE ACCEPTED BY THE CONGRESS.

THE NUCLEAR WASTE POLICY ACT HAD TWO BASIC PREMISES. THE FIRST WAS THAT THE CONGRESS MUST ESTABLISH A PROGRAM TO DISPOSE OF NUCLEAR WASTES QUICKLY. THIS URGENCY EXISTED BECAUSE THE LACK OF A DEMONSTRATED METHOD OF RADIOACTIVE WASTE DISPOSAL THREATENED THE VIABILITY OF NUCLEAR POWER IN THE UNITED STATES. INDEED, AT THE TIME THE ACT WAS BEING WRITTEN, THE SUPREME COURT WAS CONSIDERING WHETHER TO OVERTURN THE CALIFORNIA STATUTE, WHICH CONDITIONED THE EXPANSION OF NUCLEAR POWER ON THE DEMONSTRATION OF SUCH A SOLUTION. THE NUCLEAR INDUSTRY VIEWED THE PASSAGE OF THE NUCLEAR WASTE POLICY ACT AS PART OF AN EFFORT TO WIN THAT LAWSUIT AND OVERRULE THE CALIFORNIA STATUTE.

THE SECOND PREMISE OF THAT LEGISLATION WAS THAT THE RADIOACTIVE WASTE PROBLEM WAS A POLITICAL PROBLEM AND NOT A SCIENTIFIC ONE. THUS, IT WAS NECESSARY TO CREATE A SYSTEM THAT WOULD OVERCOME THE POLITICAL OBSTACLES THROUGH DEADLINES AND SIMILAR MECHANISMS. IT WAS ASSUMED THAT AN ACCEPTABLE GEOLOGICAL SITE COULD BE FOUND.

I DO NOT AGREE WITH EITHER OF THESE PREMISES. WHEN THE CONGRESS WRITES NUCLEAR WASTE LEGISLATION, I BELIEVE THAT ITS PREMISE SHOULD BE THE HEALTH AND SAFETY OF THE AMERICAN PEOPLE. I BELIEVE THAT THE DETERMINATION OF WHETHER OR NOT A SAFE GEOLOGICAL SITE CAN BE FOUND FOR NUCLEAR WASTE IS A MATTER THAT MUST BE SOLVED BY SCIENTIFIC RESEARCH AND NOT LEGISLATIVE FIAT.

LET ME GIVE THREE EXAMPLES OF HOW THE PREMISE THAT THE NUCLEAR WASTE DISPOSAL PROBLEM MUST BE SOLVED QUICKLY HAS CREATED AN UNSOUND AND UNFAIR PROCESS.

THE ACT REQUIRES THAT THE SECOND SET OF REPOSITORIES BE CHOSEN BY 1989. NOW THAT MAY SEEM LIKE A LONG TIME. HOWEVER, WHEN YOU START TO REALIZE, AS THE DEPARTMENT OF ENERGY NOW DOES, ALL THE WORK THAT HAS TO BE DONE TO MAKE SUCH A DECISION, IT BECOMES A VERY SHORT DEADLINE. DOE HAS ALREADY SLIPPED THE DEADLINE BY TWO YEARS. BECAUSE OF THE TIME PRESSURES BUILT INTO THE ACT, THE DEPARTMENT OF ENERGY HAD TO CHOOSE TO LOOK FOR THE SECOND REPOSITORY WHERE IT HAD ALREADY COMPLETED AN INITIAL GEOLOGICAL SURVEY. ITS COMPLETED STUDIES HAD ONLY LOOKED AT EASTERN GRANITE. THEREFORE, IN ITS SEARCH FOR NEW CANDIDATES FOR THE SECOND ROUND OF SITES, IT ONLY LOOKED AT CRYSTALLINE ROCK (GRANITE) EAST OF THE MISSISSIPPI. IN MAKING THIS ARBITRARY DECISION ONLY TO LOOK AT GRANITE EAST OF THE MISSISSIPPI, IT IGNORED TWO-THIRDS OF THE GRANITE DEPOSITS IN THE UNITED STATES. THEN IN LIMITING THE CANDIDATE AREAS TO CRYSTALLINE ROCK, IT IGNORED THE HUGE AREAS OF SHALE THAT IT NOW BELIEVES MAY BE ACCEPTABLE REPOSITORIES. WHY DID IT NOT LOOK AT THESE OTHER TYPES OF ROCKS? BECAUSE IT DID NOT KNOW ENOUGH ABOUT SHALE WHEN IT BEGAN THE SECOND ROUND PROCESS.

IF THE NUCLEAR WASTE POLICY ACT WERE WRITTEN ON THE PREMISE THAT IT IS MORE IMPORTANT TO FIND A SAFE SITE THAN IT IS TO FIND A SITE SOON, THE PROCESS WOULD BE VERY DIFFERENT. ALL OF THE VARIOUS POSSIBILITIES FOR GEOLOGICAL DISPOSAL WOULD HAVE BEEN THOROUGHLY RESEARCHED FIRST, AND THEN THE ENTIRE UNITED STATES WOULD BE SEARCHED FOR CANDIDATE SITES.

THE TIME PRESSURE TO FIND A NUCLEAR WASTE DUMP HAS CREATED OTHER PROBLEMS AS WELL. IN SECTION 960.3-2-1 OF THE REGULATIONS, IT STATES: "TO IDENTIFY A SITE AS POTENTIALLY ACCEPTABLE, THE EVIDENCE SHALL SUPPORT A FINDING THAT THE SITE IS NOT DISQUALIFIED IN ACCORDANCE WITH THE APPLICATION REQUIREMENTS SET FORTH IN APPENDIX III OF THIS PART." THIS IS COMPLETELY BACKWARDS. IGNORANCE IS NOT BLISS. A SITE SHOULD ONLY BE CONSIDERED ACCEPTABLE IF THE EVIDENCE SHOWS THAT IT IS ACCEPTABLE.

THINK OF A SMALL TOWN IN VERMONT THAT BELIEVES THAT ITS GRANITE HAS SEVERE STRUCTURAL PROBLEMS THAT WOULD MAKE IT AN UNSAFE WASTE DUMP. IT WOULD COST HUNDREDS OF THOUSANDS AND POSSIBLY MILLIONS OF DOLLARS TO ESTABLISH DEFINITELY WHETHER OR NOT THE FAULT EXISTS. BUT UNDER THE DEPARTMENT OF ENERGY'S REGULATIONS, THE TOWN BEARS THE BURDEN AND THE COST OF PROVING THAT IT IS NOT AN ACCEPTABLE SITE.

WHY DOES DOE NOT BEAR THE BURDEN OF PROOF? BECAUSE IF IT DID, THE WHOLE PROCESS WOULD BE BROUGHT TO A STANDSTILL.

THE DRIVE TO FIND AN ACCEPTABLE RADIOACTIVE WASTE SITE QUICKLY HAS ALSO MEANT THAT THE PROCEDURAL SAFEGUARDS USUALLY AVAILABLE TO PROTECT CITIZENS FROM ARBITRARY AND UNWISE GOVERNMENTAL ACTION HAVE BEEN SHORT CIRCUITED. NORMALLY IF CITIZENS AND STATES BELIEVE THAT AN AGENCY IS PROCEEDING UNFAIRLY, THEY CAN USE THE ENVIRONMENTAL IMPACT PROCESS AND THE COURTS TO PROTECT THEIR RIGHTS AND FORCE

THE AGENCY TO ADDRESS THEIR CONCERNS. HOWEVER, THE NUCLEAR WASTE POLICY ACT HAS BEEN WRITTEN SO THAT ENVIRONMENTAL IMPACT STATEMENTS, AND PROBABLY COURT ACTION, ARE PRECLUDED UNTIL VERY LATE IN THE PROCESS. THIS MAKES THE PROCESS GO MORE SMOOTHLY, BUT IT ALSO MEANS THAT THE PROCESS MAY VERY WELL BE SCIENTIFICALLY UNSOUND AND FUNDAMENTALLY UNFAIR.

I HOPE THAT THE COMMITTEE WILL CONSIDER THE ISSUES THAT I HAVE RAISED THIS MORNING. I HOPE IT WILL CAREFULLY EXAMINE BOTH THE PREMISES OF THE NUCLEAR WASTE POLICY ACT AND ITS IMPLEMENTATION.

IN ORDER TO ASSIST THE COMMITTEE IN THIS ENDEAVOR, I WILL BE INTRODUCING LEGISLATION TODAY WHICH PROPOSES SEVERAL CHANGES IN THE ACT. SOME OF THESE CHANGES ARE GENERIC. OTHERS SPEAK DIRECTLY TO HOW THE DEPARTMENT'S REGULATIONS HAVE BEEN IMPLEMENTED IN VERMONT.

FIRST, THE AREA RECOMMENDATION REPORT, WHICH WILL NARROW THE CANDIDATE LIST THIS FALL FROM OVER 200 TO 15 OR 20 SITES SHOULD BE SUBJECT TO THE FULL NEPA PROCESS AND COURT REVIEW.

SECOND, SECTION 112(B)(1)(C) SHOULD BE AMENDED TO REQUIRE DOE TO EXAMINE ALL POTENTIAL DISPOSAL SITES WHEREVER THEY EXIST IN THE COUNTRY.

THIRD, SECTION 960.3-2-1 SHOULD BE CHANGED TO REQUIRE THAT SITES NOT CHOSEN AS PRIORITY SITES FOR ROUND TWO SHOULD BE ELIMINATED FROM CONSIDERATION FOR TWENTY-FIVE YEARS. THIS WILL FREE COMMUNITIES FROM THE LIMBO CREATED BY EXISTING REGULATIONS.

FOURTH, THE EXISTING REGULATIONS MUST BE AMENDED TO PLACE THE BURDEN OF PROOF TO DEVELOP THE EVIDENCE NEEDED TO SHOW THAT A SITE IS QUALIFIED ON THE DEPARTMENT OF ENERGY, AND NOT ON THE LOCAL TOWN TO PROVE THAT IT IS DISQUALIFIED.

FIFTH, SEVERAL OF MY COLLEAGUES IN THE HOUSE AND THE SENATE HAVE POINTED OUT THAT POOR TRANSPORTATION FACILITIES SHOULD PRECLUDE CERTAIN SITES FROM CONSIDERATION. THE DEPARTMENT OF ENERGY HAS REFUSED TO USE TRANSPORTATION PROBLEMS AS DISQUALIFYING CRITERIA. THE LEGISLATION WOULD CORRECT THIS SITUATION.

SIXTH, THE DEPARTMENT OF ENERGY, BECAUSE IT DOES NOT UNDERSTAND OUR GOVERNMENTAL STRUCTURE IN VERMONT, HAS FAILED TO EXCLUDE FROM ITS CONSIDERATION FOR THE SECOND REPOSITORY 34 TOWNS IN VERMONT WITH POPULATIONS OF 2,500 OR MORE. THE BILL CORRECTS THIS ERROR.

SEVENTH, AS WE HAVE LEARNED FROM OUR HEARINGS IN VERMONT, THE LOCATION OF A NUCLEAR WASTE DUMP ALONG OUR CANADIAN BORDER WILL CAUSE SERIOUS PROBLEMS WITH OUR NEIGHBORS. LARGE NUMBERS OF CANADIANS HAVE APPEARED AT MEETINGS IN VERMONT TO EXPRESS THEIR OPPOSITION TO A SITE ON THE BORDER. THE CANADIAN ENERGY MINISTER HAS ALSO

OBJECTED TO THE LOCATION OF A SITE ALONG THE CANADIAN BORDER. THE LEGISLATION ADDRESSES THIS ISSUE BY REQUIRING THAT THE DEPARTMENT CONSIDER CANADIAN POPULATION DENSITY AND PRECLUDE FROM CONSIDERATION SITES ALONG THE BORDER WHICH WOULD REQUIRE GEOLOGICAL TESTING IN CANADA TO DETERMINE THEIR SUITABILITY.

FINALLY, THE REGULATIONS STATE THAT A NUCLEAR WASTE REPOSITORY SHOULD NOT BE LOCATED IN THE NATIONAL PARK SYSTEM. THE NATIONAL SCENIC TRAIL SYSTEM, WHICH INCLUDES THE APPALACHIAN TRAIL, IS, BY LAW AND REGULATION, PART OF THE NATIONAL PARK SYSTEM. THE LEGISLATION ORDERS THE DEPARTMENT NOT TO LOCATE THE NUCLEAR WASTE DEPOSITORY ON OR ADJACENT TO THIS IMPORTANT NATIONAL RECREATIONAL RESOURCE.

SINCE 1980 WHEN I HELD HEARINGS ON THE POTENTIAL IMPACT OF THE DEPARTMENT'S PLAN TO LOCATE A NUCLEAR WASTE DUMP IN RURAL AREAS, I HAVE BEEN CONCERNED THAT THE DEPARTMENT OF ENERGY DOES NOT UNDERSTAND NOR IS IT INCLINED TO UNDERTAKE THE SEARCH FOR A NUCLEAR WASTE DEPOSITORY IN A MANNER THAT RECOGNIZES THE VALUE OF RURAL AMERICA. UNFORTUNATELY, OUR EXPERIENCE IN VERMONT HAS CONFIRMED THIS CONCERN. I URGE THE COMMITTEE TO COMPREHENSIVELY REVIEW AND REFORM THE DEPARTMENT'S NUCLEAR WASTE PROGRAMS.

STATEMENT BY

BEN C. RUSCHE
DIRECTOR
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
U. S. DEPARTMENT OF ENERGY

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

OCTOBER 30, 1985

Mr. Chairman and Members of the Committee:

I am pleased to appear before you today to discuss the Department of Energy's (DOE) Mission Plan for the Civilian Radioactive Waste Management Program and the status of program activities. I appreciate the opportunity to have these discussions with the Committee so that we may keep you abreast of the progress of the program in a manner that is helpful to you as well as to us.

In my remarks, I would like to first discuss the Mission Plan in general and then focus on the current program plans, as described in the Mission Plan, for implementing the mandate for permanent disposal of spent nuclear fuel and high-level radioactive waste.

In response to Section 301 of the Nuclear Waste Policy Act of 1982 (the Act), DOE has prepared the Mission Plan for the Civilian Radioactive Waste Management Program. The purpose of the Plan, as directed by the Act, is to "...provide an informational basis sufficient to permit informed decisions to be made in carrying out the repository program and the research, development and demonstration programs required under this Act." It presents our best estimate at the present time of the objectives and the strategy of the program and of the facilities, institutional activities, management approach and data needed to successfully meet the principal objective under the Act to begin accepting spent fuel and high-level waste for disposal in deep geologic repositories by January 31, 1998.

The Act requires DOE to obtain comments on the draft Mission Plan before its transmittal to Congress. In December 1983, DOE widely circulated for comment a preliminary working draft of the overview and current program plans. And in May 1984, DOE issued a draft for review by States, Indian Tribes, the Nuclear Regulatory Commission, other Federal Agencies and the public.

In July, DOE submitted to Congress the resulting current Mission Plan, comments received on the formal draft and DOE's responses to the more than 2500 comments received. As submitted to Congress, the Mission Plan is presented in three volumes:

Volume I:	Part I - Overview and Current Program Plans Part II - Information Required by the Nuclear Waste Policy Act of 1982
Volume II:	Record of Responses to Public Comments on the Draft Mission Plan
Volume III:	Public Comments on the Draft Mission Plan

Based on the comments received, the plan is substantially rewritten and revised from the draft. Key issues that emerged during the review concerned institutional relations, plans for defense waste, waste acceptance beginning in 1998, the repository schedule, site characterization and recommendation, the need for a second exploratory shaft at each characterized site, lack of detail on the second repository schedule, monitored retrievable storage, treatment of transportation and the need for strong management and quality assurance. (Attached is a brief summary of key issues raised by the commentors and the resolution contained in the Mission Plan.)

On plans for defense waste, nearly all parties wanted more information. This issue has now been resolved as a result of the President's determination that he finds no basis for a separate repository for defense waste and, as now reflected in the Mission Plan, DOE is planning to dispose of defense waste in the civilian repository.

Prior to the President's determination of April 30, 1985, the Office of Civilian Radioactive Waste Management and the Office of Defense Programs began analyses of potential cost allocation methodologies to determine the one considered to be most equitable to both the taxpayer and the ratepayer, and which adheres to the Nuclear Waste Policy Act. This activity is nearing completion and the Department will issue a Federal Register notice in the near future, soliciting public comments on the analyses. After receipt and consideration of public comments, the Department's recommendation as to the fees to be paid into the Nuclear Waste Fund for the disposal of defense waste will be incorporated into the normal Congressional authorization and appropriations process.

A number of comments were directed to the 1998 date to begin accepting spent fuel and high-level waste for disposal. Comments, in many cases, suggested that we were being unrealistic and that there was no way to meet the 1998 date. I have taken the view previously, and we take the view in the Mission Plan, that we are committed to meeting that date.

A detailed schedule depicting our plans for achieving that date is contained in the draft Project Decision Schedule, required by Section 114 of the Act, issued for Federal agency comments in July 1985. As discussed in that document, DOE will utilize a number of mechanisms to ensure public and Congressional awareness of our progress in meeting our statutory obligations.

With regard to the preliminary determination that sites are suitable for development as repositories, the Mission Plan states that DOE intends to make that determination at the same time as the recommendation of three sites for characterization.

The Mission Plan is a document that has been under development for an extended period. It is intended to give today's best estimate of our plans and intentions. In many cases, it states not that a detailed plan is laid out, but that we will develop plans. In my view, it is not a contract, but a living document subject to change.

The Act has provided a broad, flexible framework in which to conduct the necessary activities. It has authorized certain key facilities, set schedules and formulas for arriving at fees, articulated institutional interactions, provided the opportunity to analyze the desirability of enhancements to improved program performance, and recognized the need for flexibility and contingency planning in a large, complex and controversial program that may span more than a century.

The approach which we have taken, and which we have recently outlined in the Mission Plan, evolves from the following policy goals:

- We must protect the public health and safety and the environment.
- The program must be credible to the public by virtue of its integrity and technical excellence.

- o The program must neither subsidize nor penalize nuclear power as an energy source.
- o The program must be conducted in a cost-effective manner, with full cost recovery.

The following specific program objectives have been established to implement the provisions of the Act and are reflected in the Mission Plan. They evolve from the policy goals which I have just listed and are as follows:

a. To site, obtain a license for, construct and operate geologic repositories such that the transportation of radioactive waste to and disposal of the wastes in the repositories can be accomplished in a manner that is safe and environmentally acceptable.

b. To submit a proposal to Congress to develop one or more facilities for monitored retrievable storage.

c. To ensure the acceptance of waste for disposal by January 31, 1998, in accordance with the acceptance schedule provided for in DOE's standard disposal contracts with utilities and in conformance with the Act.

d. To assist utilities in providing adequate and safe at-reactor storage for spent fuel before transfer to DOE and to provide limited Federal interim storage for any utilities found by the Nuclear Regulatory Commission to be eligible for such service.

e. To manage the technical program and the funds collected for disposal and storage services, or otherwise provided through appropriation, in an effective, integrated and efficient manner.

The strategy of the program is to ensure that the activities authorized by the Act are carried out in a vigorous manner; potentials for system-performance improvements are analyzed and incorporated where useful, including requests for new Congressional authority as allowed by the Act; and contingency plans are identified and evaluated to provide maximum confidence of the Act, notwithstanding uncertainties as to future Congressional authorization decisions and technical and institutional matters.

This strategy is presented in the Mission Plan as the "Authorized Plan," the "Improved Performance Plan" and "Contingency Plans." Attached are charts describing graphically these plans which I will discuss in detail.

With these strategies in mind, let me give you a brief status of the program.

THE AUTHORIZED PLAN

As shown in the first chart, the Act authorizes a number of key activities that, taken together, can meet the objectives of providing for the permanent disposal of spent fuel and high-level waste. In particular, the Act authorizes the development and operation of a geologic repository, the necessary transportation system for moving the wastes to the respository, and a provision for Federal interim storage. These authorities, along with other key requirements stated in the Act (that is, the need to obtain Congressional authorization for the construction of the second repository), constitute the minimum set of activities that the program will vigorously implement.

First Repository

When the Act was passed, DOE had underway field and laboratory testing at nine different sites. Typically, the field studies included the drilling of boreholes to investigate subsurface conditions and to determine whether a potentially suitable host rock existed.

The field studies were supported by laboratory studies that focused on the isolation and engineering characteristics of the rock. Measurements of groundwater characteristics were made. Also in progress were systems analysis, waste-package development and repository-design efforts.

In February 1983, in accordance with the Act, DOE formally identified those nine sties as being potentially acceptable. Those sites, as most of you know, are: one site in Louisiana, two sites in Mississippi, one site in Nevada, two sites in Texas, two sites in Utah and one site in Washington.

Also, as required by the Act, siting guidelines were developed. After a long review process, including several public hearings and consultation with affected States, Indian Tribes, and key Federal agencies, the Nuclear Regulatory Commission concurred with the guidelines and the siting guidelines were issued in final form in December 1984 and became effective January 7, 1985.

After issuance of the guidelines, we issued in December 1984, draft environmental assessments on each of the nine potential sites. These draft environmental assessments evaluated each site in terms of the siting guidelines and, when final, will be the basis for the nomination and recommendation of sites for site characterization.

In the draft environmental assessment, we announced the proposed sites for nomination and recommendation for site characterization. The proposed sites for nomination are:

- Richton, Mississippi.
- Yucca Mountain, Nevada,
- Deaf Smith County, Texas,
- Davis Canyon, Utah, and
- Hanford, Washington.

Of these five potential sites, we proposed to recommend to the President for site characterization:

- Yucca Mountain,
- Deaf Smith County, and
- Hanford.

Earlier this year, we conducted 19 public hearings and 50 formal briefings in the six States containing the nine potentially acceptable sites. We are now reviewing more than 20,000 comments received on these draft environmental assessments.

After we have completed this review, we plan to finalize the environmental assessments, formally nominate sites suitable for characterization and recommend three sites to the President for site characterization. We currently plan to do this around the end of this year. At the time of recommendation, we expect to make the Section 114 Preliminary Determination as we have discussed recently in response to your comments on this approach and as discussed in the Mission Plan.

Consultation and Cooperation

The decision to characterize a particular site formally triggers the Nuclear Waste Policy Act's Consultation and Cooperation (C&C) agreement provisions between the Department and affected Tribe or State. However, well in advance of any legal requirement to do so, the State of Washington initiated Consultation and Cooperation agreement negotiations with DOE more than a year ago, as did the Yakima Indian Nation.

We have made considerable progress in reaching agreement with Washington on virtually all issues, the key exception being liability. Recently, the Confederated Tribes of the Umatilla Indian Reservation requested the initiation of C&C agreement negotiations and these discussions are presently underway.

A Consultation and Cooperation agreement has the advantage of regularizing DOE and State or Tribe interactions. As called for in the Act, site characterization activity may proceed whether or not a Consultation and Cooperation agreement has been signed between the parties. However, I want to stress that we are committed to negotiating agreements with each of the affected parties and will diligently work to conclude agreements.

Site Characterization

To collect the subsurface data, construction of exploratory shafts at each of the three sites approved for characterization will be necessary. DOE plans to construct two shafts at each site. These shafts will be to the depth of a proposed repository -- about 1,000 to 4,000 feet deep. Shaft construction at the three sites will take approximately two years with in situ tests planned for FY 1988 through FY 1990.

Before proceeding to construct shafts at a site approved for characterization, the Act requires that DOE prepare a Site Characterization Plan. These plans will be submitted to NRC and the affected States and Indian Tribes for review and comment and will be made available to the public. Public hearings will be held in the vicinity of each candidate site to inform the area residents of the plan and to receive their comments.

During site characterization, DOE will regularly report and consult with NRC and affected States and Indian Tribes on the nature and extent of site characterization activities and the information developed from such activities.

Based on detailed technical information developed through subsurface studies which DOE will carry out during site characterization, DOE will evaluate each site and recommend one site to the President for the first repository. This recommendation will be accompanied by an Environmental Impact Statement which will have been prepared in accordance with Nuclear Waste Policy Act and National Environmental Policy Act requirements which include public review and comment and public hearings.

When the President recommends to Congress the site for the Nation's first repository, which is estimated to be in 1991, the host State Governor or legislature or affected Indian Tribe on whose reservation the repository is located may issue a notice of disapproval within 60 days of the President's recommendation. The disapproval can be overridden only by a resolution of both Houses of the U.S. Congress. Then Congress must weigh our facts against the State's or Tribe's objection.

If the disapproval is not overridden, the President is to submit another repository site recommendation to Congress within 12 months. If no disapproval is submitted, or if the disapproval is overridden, then as prescribed by the Act, the site designation is effective and DOE will submit to the NRC a License Application within 90 days.

Under the Nuclear Waste Policy Act, the NRC has three years to review the application. NRC has indicated that three years is the minimum licensing review period required unless effective steps are taken to identify and resolve potential licensing issues during the next six years. We believe that licensing issues can be identified and resolved through the effective use of the ongoing close and extensive interaction between DOE and NRC. We have allowed 27 months in the schedule for the NRC, which assumes the success of the program to resolve issues early.

With this schedule in mind, we believe we will be in a position to begin receiving waste for disposal by January 31, 1998, as called for in the Act.

Second Repository

While the Act does not authorize the construction of a second repository, it does require DOE to carry out the siting and development activities essential to preparation for such a facility. These activities trail those for the first repository by about five years.

For the second repository, DOE may consider:

(1) sites identified as potentially acceptable but not nominated for the first repository;

(2) sites characterized but not chosen for the first repository site; and,

(3) sites found potentially acceptable from rock formations not previously studied in the first repository selection process.

The screening process for the second repository is currently in the regional phase in which we have recently compiled open-literature information on the geologic and environmental conditions in crystalline rocks in 17 States in the North Central, Southeastern and Northeastern Regions of the country.

In April, we issued a document entitled, Region-to-Area Screening Methodology for the Crystalline Repository Project. The screening methodology will be used to narrow geologic focus from large regions to smaller areas in studies to identify potential crystalline sites. Using this screening methodology, later this year, we expect to identify approximately 15-20 areas in four-to-six of those 17 States in which area phase field work will be conducted. To date, no field testing has been conducted in those 17 States.

In implementing a waste disposal system, the Act places responsibility for the transportation of spent fuel and high-level waste on DOE, but also states that nothing in the Act shall be construed to affect Federal, State and local laws pertaining to the transportation of spent fuel and high-level waste. In addition, the Act directs that private industry be utilized to the fullest extent possible in performing the transportation functions.

Development of the transportation system is integral to the development and siting of repositories and in carrying out other activities within the total waste disposal system. Planning for the transportation system must provide for development and acquisition of the appropriate types and quantities of equipment and services as well as development of the appropriate institutional arrangements. In August, DOE published a draft Transportation Business Plan, which delineates activities within the development of a transportation system. A preliminary draft was issued last year. Since that time, several meetings have been held with interested parties to discuss transportation issues and to obtain private sector participation in the formulation of DOE's transportation business strategies.

In September, we issued a draft Transportation Institutional Plan. This plan proposes processes and schedules for working with potentially affected and interested groups in the implementation of the transportation aspects of the Act.

Routing and certain other safety aspects of shipments will be in accordance with Department of Transportation regulations. Cask certification and safeguard procedures will be in accordance with NRC regulations.

Transportation is probably the part of our activities which is most visible. For this reason, even though routing decisions will not be made for many years, we expect an active dialogue with the Department of Transportation, the States, Tribes and other involved parties.

THE IMPROVED-PERFORMANCE PLAN

By considering all the elements of the program as part of a single integrated system, we believe we can best meet the program objectives.

The Improved Performance plan reflects the opportunities built into the Act to evaluate options for enhancing what is authorized. Careful analyses of the provisions of the Act and of programmatic options have shown that increased confidence and improved performance can be achieved by emphasizing systems integration.

This concept of optimizing the system by integrating the facilities and components applies not only to the authorized plan but also to any other waste management system that could be developed to meet the requirements of the Act. In particular, the Act requires DOE to complete a detailed study of the need for, and feasibility of, monitored retrievable storage (MRS) and submit a proposal to Congress for the construction of one or more MRS facilities.

Analyses to date continue to reinforce the tentative conclusion that an MRS facility fully integrated into the overall waste management system, as shown in the second chart, can significantly enhance several important program objectives. And those improvements include the following:

1. Improved transportation efficiency because spent fuel consolidation and packaging at the MRS facility would reduce the number of shipments to the repository with reduction in potential environmental impacts and risks to the public.

2. Increased reliability and flexibility in operating the system in an integrated cost-effective manner by incorporating an additional facility that can regulate the flow of waste to the repository.

3. Improved confidence in DOE's ability to meet schedules, particularly in beginning to accept quantities of waste no later than January 31, 1998. The integral MRS facility would be scheduled for initial operation as early as 1996.

4. An ability to accept significantly larger quantities of waste in the early years of operation, substantially reducing the added cost of providing increased at reactor storage capabilities. And,

5. Ability to focus repository licensing efforts on demonstrating the long-term isolation capability of the site because many of the operational functions, such as waste preparation, would be handled at the MRS facility.

In April, we identified three candidate sites expected to be included in a proposal to Congress. All three candidate sites are in Tennessee.

The studies and analyses necessary to fully describe the MRS facility and to define its potential costs and benefits are being prepared. The final results will be presented in a proposal to be submitted in January 1986 for Congressional consideration. Should the Congress approve the construction of an integrated MRS facility, our improved performance plan will become our program plan.

CONTINGENCY PLANS

All of us involved in and committed to putting in place a national nuclear waste disposal system under the Act recognize that this program is controversial. There are, indeed, many constituencies with widely varying views of how, when and whether elements of the program should be carried out.

Nevertheless, this is a program intended to span more than a century, with some choices by Congress, States, Indian Tribes and the nuclear power industry yet to be made. Contingency plans, therefore, must be considered.

First, our basic assumption is that the repository will be built on schedule. As shown in Chart 3, activities would proceed under the "Authorized Plan" or the "Improved Performance Plan" previously discussed. Should the repository be substantially delayed, however, one of two contingency approaches would be pursued:

1. If the MRS facility is approved by Congress and constructed, it can begin to accept spent fuel in a timely manner and package and store it within the limited storage capacity approved until a repository becomes operational.

2. If the MRS is not approved, or if it is significantly delayed, increasing quantities of spent fuel will have to be stored at reactor sites. In that event, the pools for storing the fuel will continue to be filled, and additional on-site storage capacity through the use of dry storage in casks and similar technologies would have to be employed.

In addition, the Act authorizes us to provide up to 1,900 metric tons of interim storage for utilities who run out of storage space prior to our accepting their spent fuel for disposal. And, further, we are conducting several cooperative agreements with utilities to demonstrate rod consolidation and dry storage technologies to make available new licensed technologies for more efficient storage capabilities at the reactor sites.

What happens if either no site is found acceptable or if the host State or States disapprove the selection and that disapproval is not overridden?

In this event, we have two main contingency plans:

1. If an MRS has been approved and constructed, it can accept spent fuel on or ahead of schedule, packaging and storing it within its limited storage capacity until the "second" repository is approved and operational. This would mean that the "second" repository could become the "first" repository.

2. If an MRS has not been approved, spent fuel will continue to be stored at reactor sites in fuel pools and possibly in dry storage.

Should no repository be constructed and an MRS facility not be approved, utilities would continue to be responsible for storing the spent fuel at reactor sites. In this event, the Nation would return to the situation where it had no viable, assured method for the permanent disposal of spent fuel and high-level waste.

We realize the difficulty in predicting the future and that there are many uncertainties -- some of which remain to be identified. I, therefore, believe that an important part of our planning is the development of contingency plans such as those I have just described.

CONCLUSION

By passage of the Act, the Congress clearly found that development and implementation of a waste disposal system for spent fuel and high-level waste is an important issue and that we must get on with it. As described in the Mission Plan, I think it is fair to say that we have adopted an optimistic approach. I believe that in a program of this magnitude and importance, adopting anything less would be absolutely self-fulfilling.

We may not do as well as we plan to do, and, when we get down the road, we may find reasons why we should change certain plans. If that turns out to be the case, we will change them.

But until then, it seems to me that the right management choice, the right choice for assuring protection of public health, safety and environment is to proceed with the expectation that we will be able to address legal challenges, institutional issues and technical issues. And that is the course that we are taking and which is described in the Mission Plan.

This concludes my prepared testimony. I will be happy to respond to questions you or Members of the Committee may have.

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MISSION PLAN FOR THE CIVILIAN RADIOACTIVE WASTE MANAGEMENT

SUMMARY OF KEY ISSUES-
RAISED DURING REVIEW

The key issues that emerged during the review of the draft Mission Plan and DOE's proposed resolution, as presented in the Mission Plan, are as follows:

1. Institutional Relations

Many people commented on the imbalance in the draft Mission Plan between the amount of information and discussion on technical areas such as repository site geology versus institutional issues such as the appropriate role of States and affected Indian tribes in review of program documents. The draft Mission Plan was criticized for being overly optimistic in its assessment of problems with States, inadequate airing of public views, insufficiently involving States and Indian Tribes in decision-making, and providing inadequate educational activities and information especially on the Consultation and Cooperation (C&C) process. More information was requested on procedures for the "management plan" to resolve financial, political, legal and institutional conflicts.

In response, DOE added an entirely new chapter to Part I of the Mission Plan on Institutional Relations. This chapter reiterates and expands on DOE's policy to promote "full, open and timely sharing of information" and describes the process for conducting these activities.

2. Plans for Defense Waste

Nearly all parties -- States, environmental groups, utilities, etc. -- wanted more information on the plans to dispose of defense waste.

Since issuing the draft Mission Plan, DOE completed a comparative evaluation of disposing of defense waste in a separate defense-only repository, or putting it in the civilian repositories. This study concluded that there was no compelling need for a defense-waste-only repository and that a cost savings will result if defense waste were disposed of in a civilian repository. This report was forwarded to the President for his evaluation as required by the Act. On April 30, 1985, the President notified DOE that he found no basis to conclude that a defense-only repository is required and he directed the Secretary to proceed to dispose of defense waste in the civilian repositories in conformance with the Act. As reflected in the Mission Plan, this course of action is now being pursued.

3. Waste Acceptance Beginning in 1998

The comments in this area were almost evenly divided between those seeking a strong DOE commitment to begin accepting waste by 1998, and those opposing such a commitment. In general, the utilities favored the commitment citing DOE's obligation under the "Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste." The States and the environmental groups emphasized the need for sound, defensible decision-making regardless of time constraints.

DOE recognizes both concerns and is planning to meet both obligations. The Mission Plan discusses at length waste management systems scheduled to begin operation no later than 1998 to accept and dispose of commercially generated spent fuel and high-level radioactive waste in a manner that protects the health and safety of the public and maintains the quality of the environment. At the same time, however, DOE recognizes the need to do contingency planning in the event of program delays. These activities will continue and be expanded.

4. Repository Schedule

The overwhelming majority of comments about the repository schedule stated that it was too optimistic to be achievable. Reasons for lack of confidence in the schedule included: suspect sequencing of activities to meet 1998, near-term dates missed by the end of the Mission Plan comment period, and short public review periods for program documents. Commentors suggested that the reference schedule should be DOE's best estimate of what is achievable, not what would have to occur to meet the 1998 deadline.

DOE recognizes that the reference schedule portrayed in the Mission Plan is success-oriented and aggressive. DOE regards the Mission Plan as the vehicle to present today's best estimate of what is required to be done. If unforeseen problems develop or litigation delays the program, the schedule will be altered.

5. Site Characterization and Recommendation

Many commentors requested that the Mission Plan describe the site recommendation decision methodology and how program participants will contribute to the decision process. Commentors were divided with respect to DOE's position on the timing of the Act's requirement for the preliminary determination that sites are suitable for development as repositories.

Since the draft Mission Plan was issued in April 1984, DOE issued Draft Environmental Assessments on each of the nine potentially acceptable sites for the first repository. These documents discuss in detail the process by which the proposed recommended sites were selected. With regard to the preliminary determination that sites are suitable for development as repositories, the Mission Plan states that DOE intends to make that determination at the same time as the recommendation of three sites for characterization.

6. Need for Second Exploratory Shaft

Many comments were offered concerning the need for a second shaft at each characterized site. The Nuclear Regulatory Commission (NRC) wanted additional information which justifies the large diameter of the second shaft. Many commentors, particulary State representatives, stated that the decision should be based on exploration or safety concerns and not on construction schedule savings.

DOE is planning to sink two exploratory shafts at each candidate site. The second shaft will be sized to support the safe operation of the underground testing program and will provide flexibility in the scope and duration of in situ testing.

7. Second Repository

Many commentors suggested that the Mission Plan provide more detail and schedule analysis for the second repository. Some suggested that the first and second repository schedules should be integrated and that the site nominations for the second repository should not occur before site selection for the first repository.

Revised schedules for both the first and second repositories are included in the Mission Plan. The schedules have been adjusted to make maximum benefit in the second repository program of key information and results from the first. Current plans call for DOE to recommend the first site for repository development before the sites for the second repository are nominated for characterization.

8. Monitored Retrievable Storage

DOE was requested to be more explicit about the criteria to determine whether Monitored Retrievable Storage (MRS) is needed. The utilities asked that the Monitored Retrievable Storage facility siting and licensing processes be established and initiated as soon as possible.

In the draft Mission Plan, the MRS was described as a backup to the repository in the event of major delays. Since issuance of the draft Mission Plan, analysis by DOE has led to the conclusion that an MRS facility should be an integral part of the total waste management system. Such a facility could perform spent fuel preparation and packaging functions at a central location before shipment to a repository for permanent disposal. Performance of these functions at an MRS facillity centrally located to the majority of the commercial generators of spent fuel could contribute significantly to overall systems efficiency and timeliness while reducing the total shipment miles. The Mission Plan reflects the recent announcement of three potential sites for a proposed MRS facility and preparation of the MRS proposal to Congress required by the Act.

9. Transportation

Several commentors, primarily State representatives, criticized the general treatment of transportation complexities and importance as inadequate. Some portrayed the resolution of transportation issues as the most significant obstacle to siting and operating a repository. Among the issues most frequently raised were: prenotification to States and communities of waste shipments; emergency response capabilities; safety and security of transportation casks; and resolution of legal and regulatory conflicts.

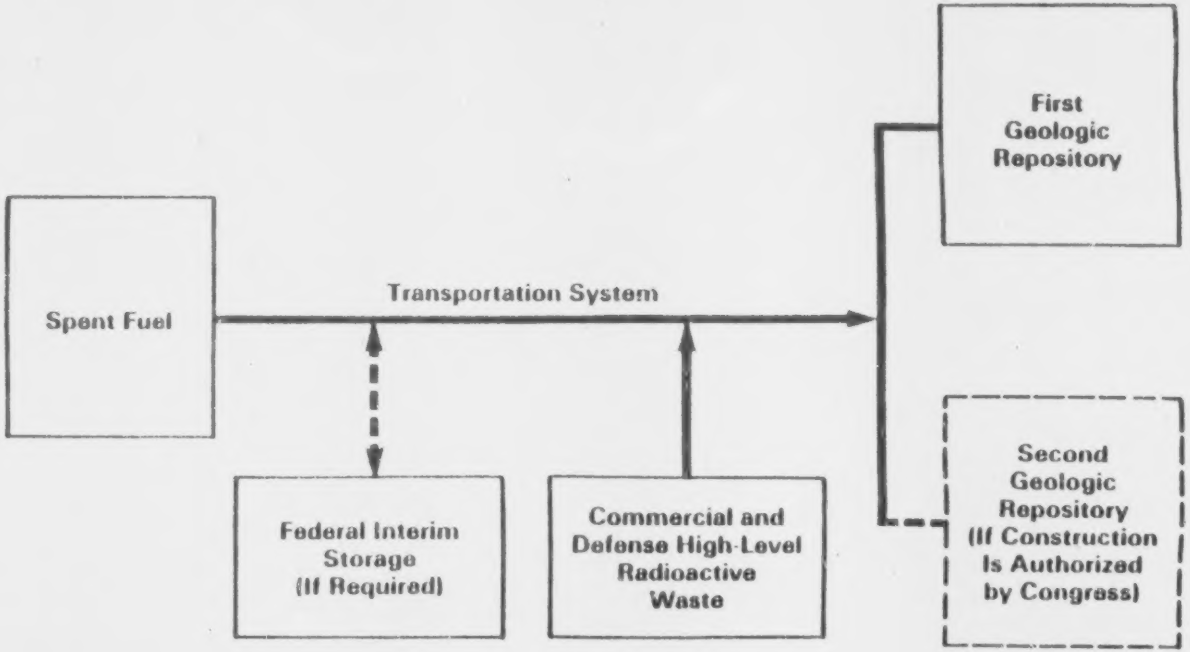
The purpose of the Mission Plan is to provide an overview of program goals and an outline of current program policies and plans. The Mission Plan now incorporates a more detailed account of transportation issues than was contained in the draft Mission Plan. However, an in-depth discussion of the above issues is reserved for two supplementary documents: the Transportation Business Plan and the Transportation Institutional Plan scheduled for release in draft form later this year.

10. Need for Strong Management and Quality Assurance

Many reviewers advised that strong, centralized management is needed for program elements such as policy formulation, program planning, program implementation, funds control, legal affairs and coordination with other interested parties. Most of the concerns centered around the decision to execute the program through a network of decentralized operations offices. Many commentors, especially the NRC, felt the description of DOE's quality assurance program contained in the Mission Plan was inadequate.

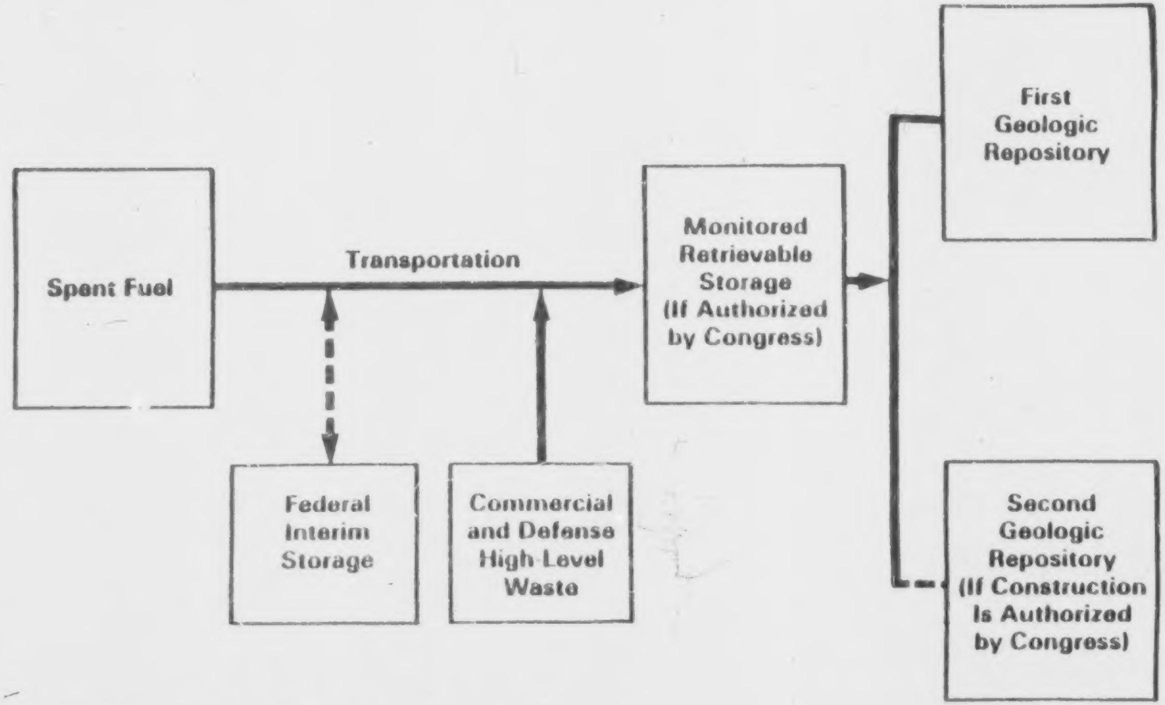
DOE agrees that strong centralized management is necessary and has rewritten the Program Management Chapter to provide a more complete description of the system being implemented by the Office of Civilian Radioactive Waste Management (OCRWM). The Mission Plan has clarified that while execution of the program by DOE operations offices and contractors is decentralized, overall policy formulation, program planning, and management control is centralized at Headquarters in Washington, D.C. A new section on Quality Assurance has been added to the Program Management Chapter to provide a more detailed discussion of the Quality Assurance activities.

Authorized System


Spent Fuel
Transportation System
Federal Interim Storage (If Required)
Commercial and Defense High-Level Radioactive Waste
First Geologic Repository
Second Geologic Repository (If Construction Is Authorized by Congress)

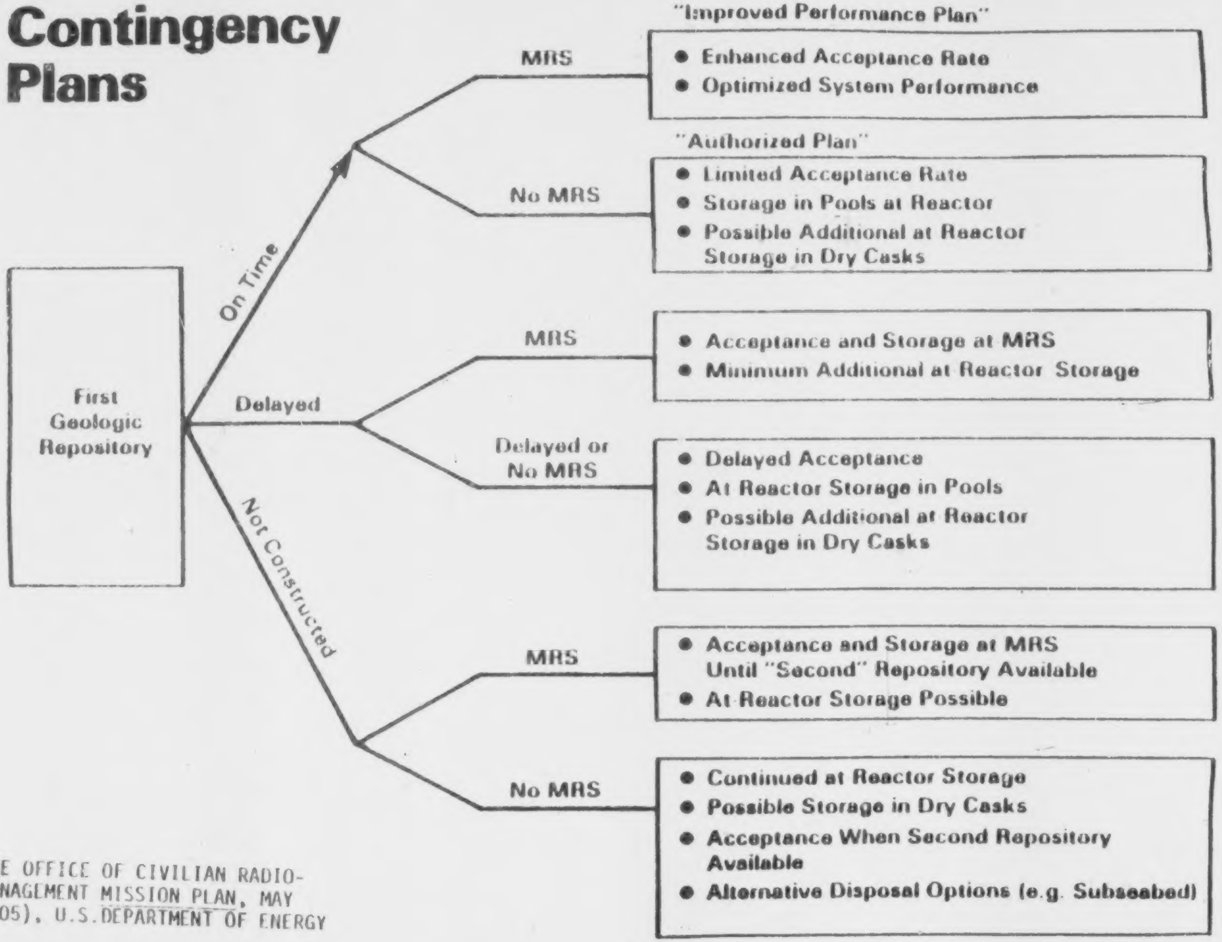
EXCERPT FROM THE OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT MISSION PLAN, MAY 1985 (DOE/RW-0005), U.S. DEPARTMENT OF ENERGY

Improved Performance System


Spent Fuel
Transportation
Federal Interim Storage
Commercial and Defense High-Level Waste
Monitored Retrievable Storage (If Authorized by Congress)
First Geologic Repository
Second Geologic Repository (If Construction Is Authorized by Congress)

EXCERPT FROM THE OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT MISSION PLAN, MAY 1985 (DOE/RW-0005), U.S. DEPARTMENT OF ENERGY

Contingency Plans


First Geologic Repository
On Time
Delayed
Not Constructed
MRS
No MRS
MRS
Delayed or No MRS
MRS
No MRS
"Improved Performance Plan"
• Enhanced Acceptance Rate
• Optimized System Performance
"Authorized Plan"
• Limited Acceptance Rate
• Storage in Pools at Reactor
• Possible Additional at Reactor Storage in Dry Casks
• Acceptance and Storage at MRS
• Minimum Additional at Reactor Storage
• Delayed Acceptance
• At Reactor Storage in Pools
• Possible Additional at Reactor Storage in Dry Casks
• Acceptance and Storage at MRS Until "Second" Repository Available
• At Reactor Storage Possible
• Continued at Reactor Storage
• Possible Storage in Dry Casks
• Acceptance When Second Repository Available
• Alternative Disposal Options (e.g. Subseabed)

EXCERPT FROM THE OFFICE OF CIVILIAN RADIO-ACTIVE WASTE MANAGEMENT MISSION PLAN, MAY 1985 (DOE/RW-0005), U.S. DEPARTMENT OF ENERGY

POST-HEARING QUESTIONS AND ANSWERS
RELATING TO OCTOBER 30, 1985
HEARING BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

WITNESS:

BEN C. RUSCHE
DIRECTOR, OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
UNITED STATES DEPARTMENT OF ENERGY

QUESTIONS FROM SENATOR STAFFORD

QUESTION 1: If the repository is safe, then why is it necessary to site it away from cities?

ANSWER: It is the intent and primary objective of DOE to site a repository that will provide safe and permanent disposal of high-level nuclear waste. The statutory basis for this program lies in the Nuclear Waste Policy Act of 1982 (NWPA). The NWPA requires that DOE consider population factors in the siting of a repository in order to minimize any potential risk to the public from expected or accidental exposure to radiation due to releases from repository surface facilities. This was intended to avoid the selection of surface facilities located on or immediately adjacent to highly populated areas, primarily to protect the public during preclosure operations when nuclear wastes are being received and emplaced. The Siting Guidelines address this issue.

DOE has applied many disqualifying, favorable, and potentially adverse conditions of the Siting Guidelines to the potentially acceptable sites for the first repository in order to ensure the selection of a licensable repository site. Some

ANSWER 1: (cont.)

of these factors included guideline findings for population density. A similar process is being followed for the second repository.

The screening methodology for the second repository uses highly populated areas and one-square-mile areas having greater than 1000 people as demographic disqualifiers. However, distance from such areas is only one of 20 screening variables used in the selection of candidate areas. The location of areas for the second repository will depend, in part, on the relative importance of all 20 variables for a particuler area, which were determined in two weighting workshops, one for States and another for DOE technical experts. Additionally, in its sensitivity analysis, DOE is considering modified scales related to distance to highly populated areas in order to determine the effect of this variable on the areas selected in region-to-area screening. The results will be documented in the Area Recommendation Report which will be issued in draft for public comment and review in early 1986.

QUESTION 2: Is the DOE's ability to meet the EPA's "generally applicable environmental standards" dependent on how far the repository is from a populated area?

ANSWER: No, the DOE must meet the EPA's standards at the accessible environment. Any populated area would, by the definition of accessible environment in the standard, be beyond the edges of the accessible environment.

QUESTION 3: The DOE Siting Guidelines disqualify a potential site from consideration if "during repository siting, construction, closure, or decommissioning the quality of the environment in the affected area could not be adequately protected or projected environmental impacts in the affected area could not be mitigated to an acceptable degree, taking into account programmatic, technical, social, economic and environmental factors."

3(a): When will DOE make this determination for the second repository sites?

ANSWER: As with the first repository siting process, siting decisions for the second repository will be made sequentially with the initial identification of potentially acceptable sites (PASs), followed by an area study phase, then issuance of environmental assessments (EAs) and nomination and recommendation of sites. Any of the PASs may be deferred or disqualified during subsequent siting evaluations. Any decisions to defer or disqualify sites will be fully documented and available for public comment.

QUESTION 3(b): How will DOE decide whether impacts could be mitigated to an acceptable degree?

ANSWER: In the EAs accompanying site nomination, DOE will assess the impacts, and the extent of potential mitigation, for both site characterization and repository development, operation and closure. In addition, monitoring and mitigation (M&M) plans will be prepared to document the likely effects of repository site characterization. In the M&M plans, DOE will establish procedures for measuring the effects of site characterization, and will work with other state and local governments and other Federal agencies to determine the measures needed to mitigate impacts to acceptable levels.

Similarly, at the end of site characterization, DOE will prepare an environmental impact statement (EIS) in which the impacts of repository development and operation will be assessed and compared among the candidate sites. The nature and effectiveness of impact mitigation will be a key element of this assessment.

QUESTION 3(c): Do you think it is possible to mitigate to an acceptable degree irreversible changes in historic and traditional ways of life?

ANSWER: Irreversible changes in historic and traditional ways of life are, by definition, unmitigable. DOE is committed, however, to mitigate the effects of repository development to the extent practicable.

For example, the development of a Programmatic Memorandum of Agreement with the Advisory Council on Historic Preservation and the State Historic Preservation Office of each affected state is also helping to guide mitigation activities relevant to protecting areas of significant historic, traditional, or cultural value. DOE will continue similar relationships throughout the siting process for the first and second repositories.

QUESTION 4: DOE's siting guidelines consider an increase in business, employment, and government services to be a favorable condition for siting a repository. Has DOE considered that these increases may represent a disruption of a way of life and that local communities may not want these increases? Has DOE considered that the presence of these favorable conditions may also cause some adverse conditions -- such as social strains on the community, changes of community character, and increase of crime, or others?

ANSWER: DOE recognizes that increases in economic activity and government may disrupt certain ways of life and that some communities may not want these increases. Chapter 11 of the Mission Plan address generic socioeconomic impacts and acknowledges that growth may cause significant disruption of communities. For example, "A large increase in the size of a community may alter the age distribution of its residents, its ethnic composition, and the ratio of males to females. These changes will affect the way residents interact with one another and may influence the quality of life in that area" (p. 410). In addition, "Public opinion about a repository will vary. Some community members will oppose it because of potential changes to their community and lifestyles" (p. 411).

The draft environmental assessments also acknowledge the potential for social and economic disruptions in the area(s) of the nominated sites.

ANSWER 4: (cont.)

For example, the EA for the Richton dome site notes that "large population in-migrations are often considered to be the impetus for community lifestyle changes" and that "the potential for the largest lifestyle impacts will occur in Richton" (p. 5-111). The draft EA for the Davis Canyon site recognized that there is a potential for a "significant increase in the reported cases of alcoholism, child abuse, mental illness, drug abuse, crime, suicide attempts, and divorce" (p. 5-127). Some commenters at public hearings on the draft EAs indicated that they do not view economic growth as being favorable, and DOE will fully consider these views in the final EAs.

DOE will evaluate the potential effects of economic growth in much greater detail during site characterization. The results of these continuing investigations will be reported in the environmental impact statement.

QUESTION 5: To what extent is DOE considering the adequacy of existing roads and the transportation impacts of a repository in its selection process?

ANSWER: The Siting Guidelines focus analysis on the possible effects of nuclear waste transportation near the potential repository sites being considered. The guidelines require an evaluation of local transportation networks between the site and regional networks. Preliminary cost estimates for upgrading existing routes and building new routes have been made in the draft Environmental Assessments (EAs) for the first repository. These estimates will be refined in the site characterization and will be included in the environmental impact statement accompanying DOE's recommendation to the President of a site for the construction of the first repository. For the second repository, possible transportation effects have been used as a siting variable for screening purposes, but the size of the current areas under consideration allows only regional transportation networks to be considered. Evaluations of local transportation infrastructure among potentially acceptable sites and the respective regional transportation networks will be initiated during the area phase for the second repository and will be presented in the EAs prepared for those sites.

QUESTION 6: The New York Times recently reported that if the sites now under consideration for the first repository proved unsuitable or legal challenges delayed the selection process, the first repository could be placed in one of the 17 states now under consideration for the second repository. It is my understanding that the only circumstances in which a site in the second tier would be considered for the first tier would be if at least five of the sites in the first tier proved unacceptable after characterization. Will DOE consider second-track sites if there are significant delays in choosing or characterizing a first-track site?

ANSWER: The Department has no intention or plans to include sites in crystalline rock as possible candidates for the first repository. Because of the care the Department is taking in complying with the requirements of the NWPA in evaluating the nine sites under consideration for the first repository, we foresee no substantial legal or technical delays in carrying out our responsibilities under the law. It is extremely unlikely that all nine potentially acceptable first repository sites will be found unsuitable. If that were to happen, DOE would turn to sites in crystalline rock for consideration for the first repository. With respect to what DOE would do in the event of significant delays in the first repository siting program, two points must be considered. First, as noted above, DOE believes significant delays will not occur because of the careful deliberate approach being taken by DOE in complying with the NWPA. Second,

ANSWER 6: (cont.)

the crystalline rock program will not be at the stage of the first repository program for five to six years. Consequently, crystalline rocks do not constitute a timely programmatic alternative for meeting the first repository's program's goal of beginning repository operations by 1998.

QUESTION 7: There is some concern in Canada that the United States may site a repository near the Canadian border. In a letter to Governor Kunin of Vermont dated October 11 of this year, Secretary Herrington stated that "the Department will exclude from further consideration areas which as a result of their proximity to the border, could require sampling/field work in Canada. Beyond this, there have been no agreements to exclude any specific sites. Therefore, the Vermont sites will be considered on the same basis as all of the other sites under review." Is this as accurate statement of the Department's current position?

ANSWER: Yes, this is an accurate statement of DOE's position. Any areas requiring sampling or field work in Canada would be excluded from further consideration.

DOE and State Department officials have met twice with Canadian officials to discuss the second repository program and second repository rock bodies near the Canadian border. DOE agreed to: (1) keep appropriate officials informed about the site selection process; (2) provide the Canadian government an opportunity to comment on the Draft Area Recommendation Report at the same time as crystalline states and Indian Tribes; (3) affirm its commitment to consider international obligations in the siting process; (4) provide the Canadian government advance notification of any candidate areas near the Canadian border; and (5) not to do any field work on or under Canadian soil.

QUESTION 8: As I understand it, the repository is not required to be designed so that there will be no releases of radioactivity into the environment around the repository; rather, the EPA standards and NRC regulations require that the releases be within certain limits. For example, EPA predicts that when all the reactor waste is disposed of in accordance with the proposed standards, it would cause no more than 1,000 premature deaths from cancer for the next 10,000 years, which is about one premature death every ten years. If a repository were located near the Canadian border, would it be possible that some of these premature deaths would be among Canadians?

ANSWER: The health and safety of the public is of the highest concern to the DOE and regulatory agencies such as NRC and EPA - no matter where a repository is ultimately constructed.

Over the long term, it is extremely improbable that biologically important concentrations of the wastes will ever reach the human environment from 1,000 to 2,500 feet below the earth's surface. Implicit in the EPA releases limits is the notion that the hazard should be no greater than that from uranium ore if it were left unmined. EPA also believes that the release limits keep the risk far lower than from natural background radiation.

QUESTION 9: Would the siting of a repository near the Canadian border create a risk of increased radiological exposure to the Canadian environment?

ANSWER: Again, the health and safety of the public is of the highest concern to the DOE and regulatory agencies such as NRC and EPA - no matter where a repository is ultimately constructed.

Any radiological health effect to people living in the vicinity of the repository is expected to be insignificant. During normal repository operations (up to 30 years), additional exposure from nuclear wastes to the general population near the repository is estimated to be a millionth or less of the exposure they would receive from naturally occurring, undisturbed radioactive elements.

Health effects most likely to occur during construction, operation, and decommissioning of the repository would be nonradiological and similar to those of any large mining operation. Construction and repository workers would have the greatest potential risks and these risks will be minimized by careful design and accident prevention programs.

At any time during the construction, some radon gas would be released from the disturbed rock, resulting in a small increase in natural radiation

ANSWER 9: (CONT.)

levels in the vicinity. Various potential accidents are being evaluated as part of the design process for the repository. Such events are considered during design phases to ensure that the health and safety of the workers and the public will be protected if there should be an accident. Further, any radiation exposure to the general population from vehicles carrying casks of high-level or transuranic waste would be insignificant. The dose to persons near (100 feet to 2,500 feet) the route of a vehicle containing spent fuel (or high-level waste) would be from 0.0006 to 0.000001 millirem per shipment. If 1,000 of these casks went by the same house every year, the increase in radiation exposure to the inhabitants would be less than one percent of the dose due to natural background radiation.

All realistic potential health and safety effects are being studied extensively, and measures to avoid or alleviate them are being incorporated into site selection criteria and repository designs.

QUESTION 10: Other countries may not consider our environmental standards to be appropriate for areas within their borders. Should the applicable environmental standards be more stringent for sites that are near international borders?

ANSWER: The environmental standards applicable to the repository development process are sufficiently conservative to ensure public health and safety and to protect the environment on both sides of the border.

QUESTION 11: Should we guarantee to countries on our border that we will not site a repository at a site near the border if there is any possibility that such a site could cause contamination or exposures across the border?

ANSWER: In siting nuclear waste repositories, DOE is attempting to provide safe and permanent disposal of high-level nuclear waste and spent nuclear fuel. Sites which possess characteristics favorable to the long-term containment and isolation of nuclear waste are the most favored. Although proximity to international borders is not an important consideration in terms of geologic isolation or containment, DOE will not select sites which are so close to international borders as to require field testing in other countries. Moreover, U.S. regulatory standards applicable to repository development are designed to ensure no endangerment of public health and safety or the environment. If a candidate repository site cannot meet the standards set by the Nuclear Regulatory Commission and the Environmental Protection Agency, a repository at that site will not be developed.

QUESTION 12: Both the Office of Technology Assessment and the General Accounting Office have criticized DOE for inadequate contingency planning. OTA has suggested that DOE plan to characterize four sites and GAO has recommended that DOE develop contingency plans for detailed testing of at least one additional repository to ensure timely availability of a site. Both agencies say the insurance against delay would be worth the additional cost. How do you respond to these suggestions of OTA and GAO?

ANSWER: DOE, like OTA and GAO, endorses the use of contingency planning for a program as complex and multi-faceted as the repository siting program. DOE has considered and, as the siting program proceeds, will continue to consider the characterization of additional sites. At this time, DOE firmly believes that the characterization of the three preferred sites will produce at least one site suitable for development of a repository. The incremental benefits of characterizing a fourth site do not appear to outweigh the incremental costs of that action.

QUESTION 13: In its national survey of crystalline rock formations, DOE found that "there is a reasonable likelihood that geologically suitable repository sites exist in each of the major regions of crystalline rock in the coterminous United States, and perhaps also in the smaller scattered occurrences outside these regions." DOE stated, however, that the national survey was not "a detailed evaluation of regions or of any smaller subunits within regions." Nonetheless, DOE concluded that the crystalline rocks in the Northeastern, North Central, and Southeastern regions of the United States "probably can be explored more effectively and sites probably could be found, characterized, verified, and licensed more readily there than elsewhere." The majority of the crystalline rock excluded at this stage was in Wyoming, Idaho, Arizona, and Washington.

QUESTION 13(a): What is the scientific basis for excluding in entirety, without detailed study, these regions for which there was a reasonable possiblity of finding a suitable site?

ANSWER: The reasons for not recommending further study of those regions where occurrences of crystalline rock may be geologically suitable, are discussed in the National Survey (OCRD-1). Arizona occurrences were excluded from further study because the individual rock formations were small and were located in areas of high topograhic relief. In addition, evidence of Quaternary volcanic activity and active faults exist in the region. Idaho and Wyoming rocks were excluded from further study because of the high relief which indicates high hydraulic gradients, high erosion rates, and potentially inaccesible terrain. The Washington crystalline occurrences were excluded from further study primarily because Washington rocks are

ANSWER 13(a): (cont'd) in areas of high topographic relief. Therefore, hydraulic gradients are anticipated to be high and large amounts of vertical movement took place during the last 10 million years. In addition, Holocene volcanism has occurred in western Washington and the western Washington rocks have high heat flow and contain hot springs.

QUESTION 13(b): What does the DOE mean when it says that the sites in the three referenced regions can be licensed more readily there than elsewhere? What is the basis for this statement?

ANSWER : The three regions recommended exhibit a higher likelihood of having the following favorable conditions discussed in OCRD-1 than other areas:

- Exposed or near-surface crystalline rocks
- Less than 1,000 meters of vertical movement in the last 10 million years
- No known young faults (i.e., 15 million years old or younger)
- No epicenters of historic earthquakes of Modified Mercalli intensity V or greater
- Horizontal acceleration of the ground surface probably less than 10 percent g in the next 50 years
- No known Quaternary volcanic rocks
- No known major metallic or nonmetallic mineral deposits
- No known high-temperature convective ground-water systems

The crystalline rocks of the three regions have extensive areas that are more conducive to siting flexibility.

QUESTION 13(c):	No reasons were given for the deferral of consideration of the sites in Washington. Why were the sites in this state deferred?
ANSWER:	The recommendation that crystalline sites in Washington not be studied further is based on the fact that crystalline occurrences in Washington are in areas of high topographic relief. Therefore, hydraulic gradients are anticipated to be high and large amounts of vertical movement took place during the last 10 million years. In addition, Holocene volcanism has occurred in western Washington and the western Washington rocks have high heat flow and contain hot springs.

QUESTION 13(d): It appears that the sites in one state were deferred from further consideration because "the U.S. Geological Survey already is studying geologic environments in that part of the Basin and Range region." Why is this a basis for deferral? What are the results of the USGS survey?

ANSWER: In addition to the scientific considerations for excluding the Basin and Range region from further exploration by DOE, the crystalline rock areas in Arizona were excluded because they are part of a geologic environment being studied by the U.S. Geologic Survey. At the time that recommendations were made for regions to be explored by DOE, it was felt that the work being performed by the USGS should not be duplicated.

In 1984, the USGS completed its screening of the Basin and Range region and identified possible areas for further study in crystalline and other rock types. Of those areas in crystalline rock, approximately 1,500 square miles of land were found to be potentially suitable. However, the rock bodies identified are too small and scattered to provide a basis for regional screening by DOE. In addition, the USGS report identified areas of high relief, Quaternary faulting, Quaternary volcanism, high heat flow, or ground water withdrawal, and active and potential mining activities among and near the crystalline rock bodies. The results of the USGS report add support to DOE's recommendation to exclude the Basin and Range region from further study.

QUESTIONS FROM SENATOR MOYNIHAN

QUESTION 1: There has been much discussion of the efforts being made to try and keep to the schedules outlined in the Nuclear Waste Policy Act. Ought we to consider modifying these schedules? Please consider in your answer that Congress may or may not approve the construction of a Monitored Retrievable Storage facility.

ANSWER: The schedules laid out in the Act are important and we are committed to making every attempt to meet them. However, this must be balanced with doing the job in a technically competent manner and assuring protection of public health, safety and the environment. We took more time to complete some of the early actions called for in the Act by allowing greater public involvement than required. We believe this has resulted in higher quality products and reflects the concerns and input of those affected by the program. Overall, we consider that the Act is working and amendments to modify the schedules in the Act at this time are not necessary.

QUESTION 2: Please explain in some detail your views on the proper time to perform characterization for each potential repository site, and the number of sites for which you believe characterization ought to be done.

ANSWER: The Nuclear Waste Policy Act of 1982 (Act) provides specific provisions of when site characterization should be performed and the number of sites which should be characterized. The Department fully endorses and is in the process of implementing these requirements of the Act.

Specifically, Section 2, item (21) defines the term "site characterization," while Section 112 specifies the number of sites to be nominated (at least 5) and the number of sites to be recommended for characterization (3). Section 113 of the Act provides specified details on the site characterization process.

Currently, the Department is in the process of preparing Environmental Assessments for the sites which will be nominated for the first repository. These Assessments will also serve as the basis for recommending 3 sites for detailed site characterization. We expect to issue the Environmental Assessments in Early 1986.

QUESTION 3: In discussions of how best to dispose of low-level wastes, it has been suggested that the most radioactive of the low-level wastes (the so-called C+ or C wastes) might be handled most appropriately by disposal in a high-level repository. What are your views on the advisability of doing so? What might be the practical impact, if any, on the high-level program?

ANSWER: The Department considers that the question of radioactive wastes not now covered by the Low-Level Radioactive Waste Policy Act and the Nuclear Waste Policy Act of 1982 is important and needs to be addressed by Congress. It is premature at this time to determine if disposal in a high-level repository is most appropriate. Many related factors need to be considered such as amount of waste, degree of containment required, standards for disposal, etc. The Department recommends that a sufficient period be established to evaluate these factors prior to a final decision on the method of disposal.

QUESTION 4: Do you believe that the 1 mil/kilowatt hour surcharge on nuclear electricity will be sufficient to fund this program? How do you calculate that this might be changed under proposals to modify the Price-Anderson Act that would tap the Nuclear Waste Disposal Fund for coverage of DOE contractor liability?

ANSWER: The adequacy of the current 1 mil/kwh fee is determined by comparing the life cycle costs of the program, as contained in the annual Total System Life Cycle Cost report, with projected revenues. The most recent fee adequacy report was submitted to the Congress in February 1985. That report indicated that no adjustment to the fee was warranted at that time. Analyses in preparation for the next fee adequacy report are currently underway. Once the results of the analyses are completed, a determination as to the necessity of adjustment to the fee can be made. Modifications to the Price-Anderson Act which would draw upon the Nuclear Waste Fund (NWF) would of course have an impact on the status of the NWF. However, the precise impacts cannot be determined until the specific provisions of any modification are considered in the overall fee adequacy analyses process.

QUESTION 5:	Concern has been expressed about the potential problems of transporting spent fuel to a repository over snowy mountain roads. To the extent that you believe transportation is a valid concern for this program, do not congested urban areas pose comparable problems for safety and security?
ANSWER:	Transport of radioactive material, or any cargo for that matter, during hazardous weather conditions or though congested urban areas is more difficult than under normal conditions. Radioactive material packages are designed to effectively mitigate the hazardous nature of the cargo, so that radioactive materials can be transported safely and efficiently in general commerce with limited additional restrictions. Abnormal weather conditions or congested urban areas do result in increased risks and should be avoided to the extent practicable. The radioactive material packages for spent fuel are designed to withstand severe conditions created during accidents. The vast majority of accidents involving a spent fuel cask would be of no more consequence than accidents involving any non-hazardous commodity. Nevertheless, the driver of spent fuel cask shipments routinely contacts local law enforcement agents to determine whether adverse weather or road conditions will inhibit travel. If weather induced hazards exists, the driver is instructed to stop at pre-established safe havens until road and weather conditions are satisfactory.

Answer 5: (con't.)

Furthermore, Department of Transportation routing regulations require the use of routes that minimize risk and that use Interstate System bypasses or beltways round urban areas. Consequently, the safety of spent fuel shipments is ensured in depth through design or packages that can resist accident conditions and through administrative controls in effect during transit.

Additional security requirements are imposed by the NRC for safeguarding shipments that must traverse highly populated areas, but they are being reconsidered in light of recent experimental work which has shown the effects of intentionally destructive acts to be several orders or magnitude less of a hazard than analytically predicated earlier.

QUESTIONS FROM SENATOR LAUTENBERG

QUESTION 1:	Are there any sites in New Jersey being considered as a possible repository site? If so, please provide us with a list of these New Jersey sites and an appropriate map with site locations.
ANSWER:	DOE is considering 19 rock bodies in New Jersey as potential locations for the second repository. A map taken from the Northeast Regional Characterization Report has been enclosed which illustrates the location and nature of each rock body being considered.

QUESTION 2: Is December 15, 1985, the current deadline for the next decision on narrowing the number of sites?

ANSWER: No. The draft Area Recommendation Report (ARR) will contain the next reduction of sites being considered. The draft ARR is tentatively scheduled for publication in January 1986.

QUESTION 3: Do you anticipate that any New Jersey locations will remain under consideration as possible sites when the current list of 220 sites is narrowed to about 20 sites?

ANSWER: The basis for DOE siting decisions and the results of the region-to-area screening will be identified in the draft Area Recommendation Report.

QUESTION 4: What is the current rate of production of high-level radioactive civilian waste as well as military waste and waste from other sources? Is there a need, from an engineering standpoint, for a second repository, if no new growth occurs within the nuclear industries?

ANSWER: The current generation rate for civilian spent fuel is 1,300 metric tons uranium (MTU) per year and is projected by the Energy Information Administration (EIA) to grow to about 1,700-2,500 MTU by the year 2000, depending on the selection of nuclear growth and spent fuel burnup scenarios. Under the extended burnup scenario, approximately 106,400 MTU of spent fuel will have been discharged in the Mid-Case and 74,600 MTU will have been discharged in the No New Orders Case by the year 2020. Under the constant burnup scenario, about 126,600 MTU will have been discharged in the Mid-Case and 87,400 MTU will have been discharged in the No New Orders Case by the year 2020.[1]

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[1] U.S. Department of Energy, Energy Information Administration, *World Nuclear Fuel Cycle Requirements*, DOE/EIA-0436, November 1985.

Defense high-level waste is generated in liquid form and stored at three DOE sites: the Savannah River Plant, the Idaho National Engineering Laboratory, and the Hanford Reservation. The liquid waste will be converted to a solid form such as borosilicate glass before shipment to the repository. At the Savannah River Plant, the Defense Waste Processing Facility will produce approximately 500 canisters of borosilicate glass per year beginning in 1989. At the Idaho National Engineering Laboratory, a waste immobilization facility is anticipated to start operation in the year 2007 at the rate of 500 canisters per year. At the Hanford Reservation, a waste immobilization plant is anticipated to start up in the early 1990's at the estimated rate of 120 canisters per year(2). The total estimated number of defense high-level waste canisters is 16,000 by the year 2020. This amount of high-level waste is equivalent to about 8,000 MTU of spent fuel on a curie basis.

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[2] U.S. Department of Energy, Assistant Secretary for Defense Programs, An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste, DOE/DP/0020/1, June 1985.

In addition to the high-level waste from defense facilities, about 300 canisters of commercial high-level waste will be produced at the West Valley Demonstration Project, a small quantity relative to defense high-level waste.

Until the completion of site characterization, we will not be certain if there are engineering reasons which prevent using only one repository. It should be noted that for some sites, such as the Yucca Mountain tuff site and some salt domes, the repository capacity is limited by geologic features and, therefore, a second repository may be needed under any scenario.

Table D1. U.S. Annual Spent Fuel Discharge Projections[a]
(Metric Tons of Initial Heavy Metal)

Year	No New Orders Case	Low Case	Middle Case	High Case	Sensitivities		
					Middle Case		No New Orders Case, No Increased Burnup
					No Increased Burnup	Continued Higher Burnup	
1983[b]	1,186	1,186	1,186	1,186	1,186	1,186	1,186
1984	1,163	1,163	1,163	1,163	1,232	1,163	1,232
1985	1,299	1,299	1,299	1,299	1,345	1,299	1,345
1986	1,296	1,296	1,328	1,338	1,437	1,328	1,405
1987	1,601	1,601	1,674	1,767	1,667	1,674	1,625
1988	1,677	1,677	1,749	1,895	1,860	1,749	1,842
1989	1,804	1,804	1,841	1,961	2,013	1,841	1,995
1990	1,887	1,887	1,884	1,927	2,135	1,884	2,066
1991	1,767	1,777	1,802	1,831	2,173	1,802	2,064
1992	1,999	1,999	2,081	2,142	2,281	2,081	2,183
1993	1,737	1,748	1,860	1,960	2,308	1,860	2,242
1994	2,074	2,063	2,249	2,249	2,418	2,249	2,214
1995	1,796	1,795	1,918	1,999	2,428	1,918	2,224
1996	2,047	2,036	2,235	2,314	2,520	2,235	2,305
1997	1,813	1,814	2,001	2,128	2,506	2,001	2,293
1998	1,846	1,847	2,064	2,168	2,530	2,064	2,298
1999	1,857	1,858	2,074	2,079	2,516	2,074	2,317
2000	1,726	1,736	1,848	2,007	2,507	1,807	2,339
2001	1,990	1,998	2,195	2,215	2,592	2,157	2,320
2002	1,746	1,779	1,882	2,075	2,643	1,688	2,340
2003	1,951	2,006	2,347	2,370	2,738	2,331	2,366
2004	1,734	1,849	2,241	2,427	2,815	1,917	2,331
2005	1,779	1,946	2,415	2,706	3,066	2,539	2,339
2006	1,886	2,102	2,611	3,083	3,169	2,184	2,310
2007	1,769	2,031	2,534	3,107	3,284	2,598	2,343
2008	2,026	2,319	3,011	3,575	3,466	2,607	2,325
2009	1,792	2,135	2,839	3,510	3,709	2,779	2,405
2010	2,059	2,429	3,289	4,037	4,008	3,015	2,546
2011	2,206	2,649	3,560	4,446	4,278	3,200	2,713
2012	2,586	3,139	4,053	5,157	4,922	3,874	3,032
2013	2,519	3,241	4,272	5,471	5,021	3,826	2,816
2014	2,043	2,965	4,052	5,448	4,903	3,866	2,473
2015	1,629	2,713	3,987	5,328	4,649	3,441	1,799
2016	1,287	2,557	3,934	5,466	4,934	3,624	1,669
2017	1,211	2,627	4,068	5,671	4,971	3,560	1,429
2018	1,023	2,527	4,061	5,761	5,088	3,627	1,342
2019	965	2,472	3,957	6,069	5,057	3,530	1,205
2020	908	2,400	4,091	6,243	5,256	3,580	1,089

[a] Projected values have been smoothed using a 3-year moving average technique.

[b] Actual.

Sources: 1983 data from Pacific Northwest Laboratory, Reactor-Specific Spent Fuel Discharge Projections: 1984 to 2020 (Richland, Washington, April 1985); projections derived from the INM model.

Table D2. U.S. Total Spent Fuel Discharge Projections
(Metric Tons of Initial Heavy Metal)

					Sensitivities		
					Middle Case		
Year	No New Orders Case	Low Case	Middle Case	High Case	No Increased Burnup	Continued Higher Burnup	No New Orders Case, No Increased Burnup
1983[a]	10,142	10,142	10,142	10,142	10,142	10,142	10,142
1984[b]	11,442	11,442	11,442	11,442	11,442	11,442	11,442
1985	12,474	12.474	12,474	12,474	12,679	12,474	12,679
1986	14,040	14,040	14,040	14,040	14,178	14,040	14,178
1987	15,330	15,330	15,426	15,456	15,754	15,426	15,659
1988	17,277	17,277	17,498	17,775	17,680	17,498	17,554
1989	19,071	19,071	19,287	19,726	19,757	19,287	19,702
1990	20,743	20,743	20,950	21,339	21,792	20,950	21,643
1991	22,936	22,936	23,149	23,554	24,085	23,149	23,754
1992	24,370	24,402	24,693	25,218	26,275	24,693	25,896
1993	26,738	26,738	27,193	27,766	28,635	27,193	28,193
1994	28,147	28,180	28,730	29,435	31,010	28,730	30,480
1995	30,591	30,591	31,441	31,964	33,530	31,441	32,538
1996	32,125	32,125	32,946	33,762	35,919	32,946	34,864
1997	34,289	34,289	35,436	35,922	38,571	35,436	37,395
1998	36,031	36,034	37,445	37,890	41,048	37,445	39,417
1999	37,666	37,668	39,137	39,810	43,507	39,137	41,756
2000	39,861	39,864	41,658	42,159	46,118	41,658	44,345
2001	41,209	41,241	42,989	43,912	48,569	42,866	46,435
2002	43,635	43,662	45,723	46,456	51,284	45,609	48,716
2003	45,100	45,201	47,302	48,385	54,047	46,721	51,366
2004	47,061	47,260	50,029	51,021	56,783	49,859	53,535
2005	48,835	49,207	52,446	53,737	59,729	51,359	55,710
2006	50,437	51,038	54,548	56,505	63,246	54,337	58,385
2007	52,719	53,564	57,863	60,272	66,290	56,410	60,465
2008	54,142	55,301	60,048	63,060	69,580	59,153	62,739
2009	56,517	57,994	63,580	67,231	73,645	62,157	65,359
2010	58,094	59,967	66,381	70,802	77,417	64,746	67,678
2011	60,318	62,588	69,914	75,172	81,605	68,197	70,378
2012	63,135	65,941	74,259	80,568	86,479	71,758	73,499
2013	65,853	69,383	78,539	86,273	92,182	76,367	76,774
2014	67,877	72,311	82,731	91,585	96,668	79,676	78,825
2015	69,280	74,836	86,416	96,913	101,187	83,355	80,919
2016	70,740	77,522	90,502	102,257	106,129	86,690	82,170
2017	71,739	79,983	94,535	107,984	111,472	90,548	83,833
2018	72,914	82,719	98,620	113,927	116,102	94,035	85,205
2019	73,809	85,101	102,684	119,540	121,395	97,571	86,196
2020	74,635	87,397	106,404	126,192	126,642	101,138	87,449

See footnotes at end of table.

Footnotes for Table D2

[a] Actual.

[b] Preliminary data collected on Form RW-859, "Nuclear Fuel Data," indicate that 11,991 metric tons of initial heavy metal have been discharged through 1984. The 11,991 metric tons consist of 11,723 metric tons in commercial storage, 14 metric tons stored by the Department of Energy for use in research, and 254 metric tons that were reprocessed. The 11,723 metric tons of initial heavy metal in commercial storage include some irradiated nuclear fuel that will be reinserted in future cycles of the nuclear reactors.

Sources: 1983 data from Pacific Northwest Laboratory, Reactor-Specific Spent Fuel Discharge Projections: 1984 to 2020 (Richland, Washington, April 1985); projections derived from the INM model.

QUESTION 5:	When do you intend to conclude the review of your results and announce your recommendation of three sites as required by Section 114, Preliminary Determination, of the Nuclear Waste Policy Act?

The formal nomination and recommendation decisions will be made sequentially following the issuance of the final EAs and the Candidate Site Recommendation Report in the Spring of 1986.

QUESTION 6: Could you briefly describe the site selection process for a second repository site?

ANSWER: Section 960.3-2-1 of the U.S. Department of Energy (DOE) Siting Guidelines (DOE, 1984a) directs that the screening process for determining potentially acceptable sites for the second repository should begin with screening activities on large land masses that contain suitable rock with features favorable for waste containment and isolation. The national survey of crystalline rocks, presented as report BMI/OCRD-1 by the Office of Crystalline Repository Development (OCRD, 1983), was conducted as a reconnaissance of available geologic literature on large regions of exposed and near-surface crystalline rocks in the conterminous United States. The requirement that only exposed or near-surface crystalline rocks would be considered was the initial criterion established by the Crystalline Repository Project (CRP) which determined where subsequent screening efforts would be concentrated. The survey evaluated the suitability of rocks in those regions as potential sites for repositories and recommended regions of exposed and near surface crystalline rocks for further evaluation for possible repository sites.

ANSWER 6: (CONT.)

Other criteria used in the national survey were taken from draft regulations of the U.S. Nuclear Regulatory Commission (NRC) (NRC, 1981). These criteria included consideration of the following factors on a national scale:

- size of rock mass
- vertical movements
- faulting
- earthquakes
- seismically induced ground motion
- quaternary volcanic rocks
- mineral deposits
- high-temperature convective ground-water systems
- hydraulic gradients incorporating regional topographic variations
- erosion.

Section 960.3-2-1 of the DOE Siting Guidelines requires that the process to determine potentially acceptable sites (PAS) shall be developed in consultation with the involved states and shall focus on smaller, more suitable land units by first using applicable disqualifying conditions from the guidelines, and then by using applicable favorable and potentially adverse conditions.

ANSWER 6: (CONT.)

The intent of the region-to-area screening is to narrow the geographic focus within the three study regions to approximately 15 to 20 candidate areas that will be investigated and evaluated in more detail during the area phase. The region-to-area screening methodology was developed in consultation with the involved States.

The data base to be used in Steps 1 through 3 of region to-area screening to narrow the number of exposed and near-surface crystalline rock bodies currently under consideration was presented in the final regional geologic and environmental characterization reports issued in September 1985. The data have been taken from existing literature and in some cases directly provided by the 17 crystalline states.

An area recommendation report (ARR) will document the selection of those areas of exposed and near-surface crystalline rocks which are deemed suitable for area-phase investigations. A draft of the ARR will be submitted to states and potentially affected Indian tribes for review and comment. The governors and legislators of those states which contain candidate areas and the

ANSWER 6: (CONT.)

tribal representative of any potentially affected Indian tribe will be notified by the DOE that these candidate areas have been selected for further investigation including field work in the area phase. The focus of area-phase efforts will be the acquisition of new geologic, environmental, and socioeconomic data in the candidate areas that are identified as a result of region-to-region area screening.

The area screening process also will use the DOE Siting Guidelines as the basic criteria for identifying candidate sites, although the approach will not be the same as that used in the region-to-area screening described in this document. The area characterization plan (ACP) will identify those conditions from the DOE Siting Guidelines which will be used to reduce the number and size of areas under consideration. Identification of these conditions will dictate the data collection and field work that will be conducted during the area phase. The major objective of the ACP will be to describe the plans for the acquisition of field data. The approach for area screening will be developed in consultation with the involved states and potentially affected Indian tribes, and a draft ACP will be issued for their review and

ANSWER 6: (CONT.)

comment. The final ACP will be issued prior to the initiation of area-phase field investigations.

Acquisition and evaluation of these data will make it possible to further evaluate crystalline rock areas and to nominate candidate sites in crystalline rock which are suitable to be included in the Secretary of Energy's recommendation to the President of sites which should undergo detailed site characterization as potential second repository sites. In accordance with current DOE planning, this recommendation to the President is scheduled to be made in 1991. Presidential approval of any of the crystalline rock sites as a potential second repository would result in more detailed site characterization work at the approved site or sites for approximately 4 to 6 years; to be followed by the President's recommendation to Congress of a single site for location of the second repository in 1997.

QUESTION 7: Is the Continuation of Candidate Site Screening, Section 112(d) of the Nuclear Waste Policy Act, the statutory basis for the criteria which you employed for the selection of a second repository site?

ANSWER: Yes. The siting process for the second repository is in accordance with Section 112(d) of the Act.

QUESTION 8: Is there any statutory basis for excluding any of the original eight sites which were formally identified in 1983 for a second repository site?

ANSWER: Yes. The Act requires that the two nominated sites which are not recommended for site characterization will no longer be considered as repository sites. Therefore, of the nine potentially acceptable sites for the first repository, six could be designated as potentially acceptable sites for the second repository.

QUESTION 9: What consideration was given to other potentially suitable areas for the second repository site besides the crystalline rock formation areas?

ANSWER: Only crystalline rock formation areas were considered as alternative media for the second repository. Section 960.3-2 of the Siting guidelines directs that the screening process for determining potentially acceptable sites for the second repository should begin with screening activities on large land masses that are likely to contain suitable rock with features favorable to waste containment and isolation.

QUESTION 10: What was the statutory basis for limiting the regional screening phase for the second repository site to only seventeen states in the eastern part of of the country?

ANSWER: Under the NWPA, DOE is authorized to conduct site screening activities for a possible second repository. In addition, the NWPA instructed DOE to develop guidelines for siting repositories. Under Section 960.3-2-1, siting activities begin with large land masses that contain suitable rock formations. Subsequent screening activities shall focus on successively smaller and more suitable land units. The siting provisions requiring diversity of rock type, diversity of geohydrologic setting, and regionality may be used to discriminate between land units and establish the, range of options in site screening. Section 112(a) of the NWPA, the basis for regionality in the DOE Siting Guidelines, requires a consideration of the proximity to sites where HLW and SNF is generated or temporarily stored and the transportation and safety factors involved in moving such waste to a repository. However, the reason why the NC, NE, and SE regions were studied in the regional phase is based on technical considerations.

A national survey of crystalline rock formations was conducted to locate potential areas for the development of the second repository.

ANSWER 10: (CONT.)

The national survey resulted in the recommendation that further studies be conducted to investigate exposed and near-surface crystalline rocks in the Lake Superior region (i.e., the North Central Region), the northern Appalachians and Adirondacks (i.e., the Northeastern Region), and the southern Appalachians (i.e., the Southeastern Region). Consequently, the national survey provided the basis for selection of the three regions in which region-to-area screening was conducted to select areas for continued studies. Seventeen states with exposed and near-surface crystalline rock bodies were included in the three regions as stated below:

- North Central Region
  Michigan, Minnesota, Wisconsin
- Northeastern Region
  Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont
- Southeastern Region
  Georgia, Maryland, North Carolina, South Carolina, Virginia.

QUESTION 11: Was the Continuation of Candidate Site Screening the basis for the second site selection or was a new methodology used for the second site?

ANSWER: The selection of sites for the second repository will be consistent with the site selection process described in the Act. No new methodology will be used to select sites.

QUESTION 12: **How does the Region-to-Area Screening Methodology for the Crystalline Repository Project mesh with the original siting guidelines developed for the first site as reported in December 1984?**

ANSWER: The region-to-area screening methodology has been designed to allow the results to be used as the basis for the identification of candidate areas as potentially acceptable sites in accordance with the requirements of 10 CFR 960.3-2-1.

QUESTION 13: Has transportation through densely populated areas, such as New Jersey, been considered as an evaluation criterion in the siting methodology, especially as applied to the Northeast sites?

ANSWER: The transportation analyses to be contained in the Draft Area Recommendation Report for the second repository will not evaluate transportation through densely populated areas. At this stage in the site selection process, detailed analyses of population densities along routes to the preliminary candidate areas are not feasible, given the large size of those candidate areas. However, in assessing population density and distribution in the general region of the preliminary candidate areas, data on the average density within 50 miles of the preliminary candidate areas will be presented and evaluated.

STATEMENT OF THE

UNITED STATES NUCLEAR REGULATORY COMMISSION

BEFORE THE

SUBCOMMITTEE ON NUCLEAR REGULATION
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

CONCERNING
HIGH LEVEL WASTE

PRESENTED BY NUNZIO J. PALLADINO, CHAIRMAN

SUBMITTED: OCTOBER 30, 1985

WE APPRECIATE THIS OPPORTUNITY TO APPEAR BEFORE YOUR SUBCOMMITTEE TODAY TO PROVIDE THE COMMISSION'S VIEWS ON A NUMBER OF ACTIVITIES IN THE NATIONAL HIGH-LEVEL WASTE MANAGEMENT PROGRAM.

AS WE UNDERSTAND IT, THE SUBCOMMITTEE WOULD LIKE US TO COVER: THE STATUS OF OUR ACTIVITIES UNDER THE NUCLEAR WASTE POLICY ACT; OUR VIEWS ON THE DEPARTMENT OF ENERGY'S MISSION PLAN FOR THE CIVILIAN RADIOACTIVE WASTE MANAGEMENT PROGRAM; THE ENVIRONMENTAL PROTECTION AGENCY'S RECENTLY PROMULGATED STANDARDS ON HIGH-LEVEL WASTE DISPOSAL; NRC EFFORTS TO REFINE THE DEFINITION OF HIGH-LEVEL WASTE; AND OUR ACTIVITIES CONCERNING THE TRANSPORTATION OF SPENT FUEL.

CONCERNING YOUR FIRST AREA OF INTEREST, THE STAFF MAINTAINS AN ONGOING UPDATE OF THE STATUS OF NRC ACTIVITIES UNDER THE NWPA, AND NRC'S ROLE IN THESE ACTIVITIES. I WOULD LIKE SIMPLY TO ENTER OUR MOST CURRENT STATUS UPDATE INTO THE SUBCOMMITTEE'S RECORD OF THIS HEARING. AMONG OTHER THINGS, THIS UPDATE COVERS ALL OF THE ACTIVITIES ON WHICH YOU HAVE ASKED US TO COMMENT IN DETAIL, AND I WILL DISCUSS EACH OF THEM IN TURN. BEFORE I MOVE TO THAT DISCUSSION, HOWEVER, I WANT TO NOTE HERE THAT THE MAJORITY OF OUR

CURRENT EFFORTS FOR IMPLEMENTATION OF THE NWPA CONSIST OF OUR PRE-LICENSING INTERACTIONS WITH DOE.

IN ORDER TO PROVIDE FOR AN EFFECTIVE AND EFFICIENT LICENSING PROCESS FOR THE GEOLOGIC REPOSITORY, NRC IS CONTINUING ITS PROGRAM TO: DEVELOP GUIDANCE ON METHODS FOR DEMONSTRATING COMPLIANCE WITH PERFORMANCE OBJECTIVES; PROVIDE GUIDANCE TO ASSURE THAT THE DOE PROGRAM PROVIDES ESSENTIAL AND ACCEPTABLE DATA WITHOUT COSTLY DELAY OR REWORK; PROVIDE ONSITE OVERVIEW OF DOE ACTIVITIES; IDENTIFY POTENTIAL LICENSING ISSUES FOR DOE ACTION; AND PROVIDE APPROPRIATE AND TIMELY REVIEW AND EVALUATION OF NWPA REQUIRED DOE SUBMITTALS SUCH AS THE ENVIRONMENTAL ASSESSMENTS AND THE MISSION PLAN.

DOE MISSION PLAN

THE NRC HAS CAREFULLY REVIEWED PRIOR DRAFTS OF DOE'S MISSION PLAN AND PROVIDED COMMENTS TO DOE. I WILL SUMMARIZE THE COMMISSION'S PRINCIPAL OBSERVATIONS AS THEY RELATE TO THE FINAL MISSION PLAN.

FIRST, AS YOU KNOW, INADEQUATE IMPLEMENTATION OF FULLY DOCUMENTED QUALITY ASSURANCE PROGRAMS COULD CAUSE PROBLEMS IN THE TIMELY

LICENSING OF A REPOSITORY. WE ARE THEREFORE ENCOURAGED THAT IN THE FINAL MISSION PLAN, DOE IS COMMITTED TO HAVING A QUALITY ASSURANCE PROGRAM IN PLACE AND IMPLEMENTED BEFORE BEGINNING SITE CHARACTERIZATION. WE RECOGNIZE THAT THE DETAILED IMPLEMENTATION OF THIS PROGRAM, AS CARRIED OUT BY DOE AND ITS CONTRACTORS, WILL TAKE TIME. NRC WILL CONTINUE TO ANALYZE THIS CRITICAL UNDERPINNING OF DOE'S PROGRAM AS IMPLEMENTATION PROCEEDS.

SECOND, THE NRC IS COMMITTED TO IDENTIFYING AND MONITORING MAJOR LICENSING QUESTIONS SUFFICIENTLY EARLY IN THE PRE-LICENSING PERIOD SO THAT DOE CAN RESOLVE OUR COMMENTS WITHOUT DELAYING EITHER DOE'S ACTIVITIES OR THE NRC LICENSING PROCESS. OUR COMMITMENT IS LARGELY CONTINGENT ON DOE'S IDENTIFYING AREAS WHERE CONSULTATION IS NEEDED AND ARRANGING MEETINGS WITH US EARLY IN THE PLANNING PROCESS IN SUFFICIENT TIME SO THAT NRC COMMENTS ARE INCLUDED IN DOE PLANS AND PROGRAMS BEFORE DOE DECISIONS AND COMMITMENTS ARE MADE.

THIRD, THE REFERENCE MISSION PLAN SCHEDULE ALLOWS 27 MONTHS FOR NRC TO CONSIDER AN APPLICATION FOR CONSTRUCTION AUTHORIZATION. THE COMMISSION IS COMMITTED TO MAKING THE LICENSE REVIEW AS EFFICIENT AS POSSIBLE. HOWEVER, WE CONTINUE TO BELIEVE THAT THE

THREE YEARS (36 MONTHS) PROVIDED BY THE NUCLEAR WASTE POLICY ACT IS A VERY OPTIMISTIC ESTIMATE FOR THE TIME REQUIRED, AND THAT EVEN THIS DEPENDS ON THE SUBMITTAL OF AN ACCEPTABLE, COMPLETE APPLICATION OF HIGH QUALITY. WE HAVE IDENTIFIED NO SPECIFIC ACTIONS WHICH COULD PERMIT THE LICENSE REVIEW PERIOD TO BE REDUCED FROM THE STATUTORY 36 MONTHS. WE INTEND TO CONTINUE OUR EFFORTS TO WORK WITH DOE ON WAYS TO MAKE THE LICENSING PROCESS AS EFFICIENT AS POSSIBLE, CONSISTENT WITH OUR REGULATORY RESPONSIBILITY.

THERE REMAINS THE QUESTION OF THE TIMING OF DOE'S PRELIMINARY DETERMINATION UNDER SECTION 114(F) OF THE ACT. AS STATED IN THE MISSION PLAN, DOE INTENDS TO MAKE THE PRELIMINARY DETERMINATION REQUIRED BY THE ACT AT THE TIME THREE SITES ARE RECOMMENDED TO THE PRESIDENT FOR CHARACTERIZATION RATHER THAN AFTER COMPLETION OF SITE CHARACTERIZATION. THIS WAS A MATTER RAISED DURING THE COMMISSION'S CONCURRENCE PROCESS ON THE DOE SITING GUIDELINES.

IN THE NRC COMMENTS ON THE DRAFT MISSION PLAN, IT WAS STATED THAT THE MISSION PLAN SHOULD BE REVISED TO REFLECT THE NRC AND DOE AGREEMENT MADE AT THE JUNE 22, 1984 COMMISSION MEETING ON THE COMMISSIONERS' CONCURRENCE DECISION ON THE DOE SITING GUIDELINES.

THIS AGREEMENT STATED, "...THAT THE PRELIMINARY DETERMINATION SHOULD BE MADE AFTER THE COMPLETION OF SITE CHARACTERIZATION AND NOT AT THE TIME OF SITE NOMINATION AND RECOMMENDATION FOR CHARACTERIZATION."

THE COMMISSION HELD A PUBLIC MEETING ON SEPTEMBER 6, 1985 TO HEAR THE VIEWS OF INTERESTED PARTIES ON HOW THE COMMISSION SHOULD RESPOND TO DOE'S PROPOSED TIMING OF THE PRELIMINARY DETERMINATION. THEREAFTER, WE RECEIVED WRITTEN VIEWS FROM SOME OF THE PARTICIPANTS. WE ALSO CONSIDERED AN ANALYSIS BY OUR OFFICE OF GENERAL COUNSEL ON WHETHER NRC IS LEGALLY REQUIRED BY THE NWPA TO TAKE ANY ACTION NOW IN RESPONSE TO THE CHANGE IN DOE'S POSITION ON THE TIMING OF THE PRELIMINARY DETERMINATION.

ON OCTOBER 16, THE COMMISSION DETERMINED THAT DOE'S MODIFIED POSITION REGARDING THE TIMING OF THE "PRELIMINARY DETERMINATION" WAS NOT A NECESSARY CONDITION FOR NRC'S PRIOR CONCURRENCE IN THE DOE SITING GUIDELINES. ON OCTOBER 24, 1985, WE CONVEYED OUR CONTINUED CONCURRENCE ON THE GUIDELINES IN A LETTER TO DOE. WE HAVE ALSO REQUESTED THE STAFF TO PREPARE FOR COMMISSION REVIEW AN APPROPRIATE PUBLIC STATEMENT TO BE ISSUED TO RESTATE THE COMMISSION'S CONCURRENCE IN THE GUIDELINES.

COMMISSIONER ASSELSTINE DISAGREES WITH THE COMMISSION'S POSITION ON THE TIMING OF THE PRELIMINARY DETERMINATION. HE BELIEVES THAT DOE MUST EITHER CONFORM TO THE AGREEMENT ON THE TIMING OF THE PRELIMINARY DETERMINATION WHICH IS CONTAINED IN THE NRC'S CONCURRENCE DECISION ON THE DOE SITE SELECTION GUIDELINES, OR SUBMIT FOR COMMISSION CONCURRENCE A FORMAL REQUEST TO MODIFY THE SITE SELECTION GUIDELINES TO INCORPORATE DOE'S NEW POSITION ON THE TIMING OF THE PRELIMINARY DETERMINATION. HE WILL PROVIDE ADDITIONAL COMMENTS ON THIS ISSUE SEPARATELY.

AS YOU ARE AWARE, DOE IS NOW EVALUATING PLANS TO INCLUDE THE MONITORED RETRIEVABLE STORAGE (MRS) FACILITY AS AN INTEGRAL ELEMENT OF ITS PREFERRED HIGH-LEVEL WASTE MANAGEMENT SYSTEM. NRC STAFF HAS BEEN CAREFULLY OBSERVING AND REVIEWING DOE'S DEVELOPMENT OF ITS PROPOSAL TO CONGRESS CONCERNING THE MRS. WE HAVE LIMITED OUR INTERACTION TO THOSE ASPECTS OF THE MRS THAT HAVE REGULATORY SIGNIFICANCE. SHOULD CONGRESS DECIDE TO AUTHORIZE THIS APPROACH, THE NECESSARY REGULATORY FRAMEWORK WILL BE AVAILABLE ON A SCHEDULE CONSISTENT WITH THE MISSION PLAN.

BEFORE LEAVING THE SUBJECT OF THE MISSION PLAN, LET ME REITERATE THAT THE NRC'S ABILITY TO COMPLETE ACTIONS ON SCHEDULE IS

DEPENDENT ON DOE EFFORTS TO DEVELOP THE INFORMATION NEEDED TO RESOLVE TECHNICAL QUESTIONS, MAINTAIN HIGH QUALITY TECHNICAL PROGRAMS, AND PREPARE HIGH QUALITY LICENSING SUBMITTALS.

EPA'S HLW STANDARDS

EPA'S STANDARDS FOR MANAGEMENT AND DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTES (40 CFR PART 191) WERE FINALIZED ON AUGUST 15, 1985, AND APPEARED IN THE FEDERAL REGISTER ON SEPTEMBER 19, 1985. (SEE 50 FR 38066.) CONSISTENT WITH THE REQUIREMENTS OF THE NUCLEAR WASTE POLICY ACT, THE NRC WILL SOON INITIATE RULEMAKING THAT WILL AMEND 10 CFR 60 AS NEEDED FOR CONSISTENCY WITH THE EPA STANDARDS. THE NRC'S ADVISORY COMMITTEE ON REACTOR SAFEGUARDS HAS EXPRESSED CONCERN THAT THE EPA STANDARDS ARE UNREASONABLY RESTRICTIVE AND THAT DEMONSTRATION OF COMPLIANCE WILL BE EXTREMELY DIFFICULT. THE COMMISSION HELD A PUBLIC MEETING TO EXPLORE THESE CONCERNS WITH THE ACRS, THE STAFF, AND OTHERS. ALTHOUGH THE NRC STAFF CONTINUES TO BELIEVE THAT THE EPA STANDARDS CAN BE IMPLEMENTED, IT IS CONSIDERING THE ACRS'S CONCERNS IN ITS RECOMMENDATIONS FOR THE COMMISSION'S IMPLEMENTATION OF THE PROPOSED EPA STANDARD.

Definition of HLW

Under the Nuclear Waste Policy Act, the NRC has the authority to expand the definition of high-level waste to include "other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation." The technical, legal and institutional issues requiring resolution by such an expanded definition are under study by the NRC. The NRC anticipates that completion of the rulemaking on the definition of HLW will require two years.

Transportation of Spent Fuel

As you know, DOE has made commitments in its Mission Plan and other documents to comply with all applicable NRC and Department of Transportation (DOT) regulations for the transport of HLW and spent fuel. DOE plans to require all casks used to transport commercial spent fuel under NWPA to be certified by the NRC, and will assure that the transportation vehicles meet all DOT requirements. NRC has been and will continue to be involved in a number of transportation-related activities bearing on the implementation of DOE's NWPA responsibilities.

ALTHOUGH SPENT FUEL HAS BEEN TRANSPORTED FOR MANY YEARS UNDER CURRENT NRC REGULATIONS WITHOUT ANY RELEASES OF RADIOACTIVITY, EVEN FROM ACCIDENTS, NRC IS CURRENTLY COMPARING ITS CASK CERTIFICATION REQUIREMENTS AGAINST EXISTING DATA ON SEVERE NON-NUCLEAR TRANSPORTATION ACCIDENTS IN OUR CONTINUING EFFORT TO CONFIRM THE ADEQUACY OF OUR TRANSPORTATION RULES. WE EXPECT THE RESULTS OF THIS ASSESSMENT, CALLED THE "MODAL STUDY," TO BE MADE AVAILABLE FOR PEER REVIEW EARLY NEXT YEAR.

NRC ALSO PLANS TO UPDATE THE GENERIC ENVIRONMENTAL IMPACT STATEMENT (GEIS) SUPPORTING OUR EXISTING TRANSPORTATION RULES. THIS UPDATE WILL BE COMPLETED IN TIME TO SUPPORT OUR REVIEW OF ANY DOE APPLICATION, AND WILL TAKE INTO ACCOUNT THE INCREASED NUMBER OF HLW AND SPENT FUEL SHIPMENTS, THE ESTABLISHMENT OF AN MRS FACILITY AND REPOSITORY, AND THE USE OF NEW CASK DESIGNS FOR SHIPMENTS TO THESE FACILITIES.

NRC ALSO NOTED TRANSPORTATION CONCERNS IN ITS REVIEW OF DOE'S DRAFT ENVIRONMENTAL ASSESSMENTS ON POTENTIAL REPOSITORY SITES EARLIER THIS YEAR. THE STAFF ADVISED DOE THAT THE CONVERGENCE OF SHIPPING ROUTES TO AN MRS OR REPOSITORY CREATES CORRIDORS ALONG WHICH THE COMPARATIVELY LARGE NUMBER OF SHIPMENTS PER YEAR MAY

INCREASE ENVIRONMENTAL IMPACTS BEYOND THOSE NOW ENCOUNTERED IN TRANSPORTATION OF LARGE QUANTITIES OF RADIOACTIVE MATERIALS. DOE HAS SAID THAT IT WILL STUDY THIS "CORRIDOR EFFECT" IN MORE DETAIL IN PREPARING EIS'S FOR THE MRS AND REPOSITORY.

WE UNDERSTAND THAT YOU ARE ALSO INTERESTED IN NRC'S VIEWS ON S. 1162, THE BILL INTRODUCED BY SENATOR HART TO REQUIRE DETAILED ASSESSMENTS OF THE EFFECTS OF HLW TRANSPORTATION ON STATES WITH POSSIBLE SHIPMENT ROUTES. SINCE THE BILL ADDRESSES DOE RESPONSIBILITIES, WE WOULD ONLY NOTE THAT IT WOULD HAVE LITTLE DIRECT IMPACT ON NRC.

THE NRC RECENTLY SPONSORED A THREE-DAY SEMINAR WITH THE DEPARTMENT OF TRANSPORTATION ON SPENT FUEL TRANSPORTATION ISSUES. THE SEMINAR WAS WELL ATTENDED BY STATE AND LOCAL GOVERNMENT AND INDIAN TRIBE REPRESENTATIVES. IT PROVIDED AN OPPORTUNITY FOR THESE OFFICIALS TO DISCUSS THE VARIOUS WASTE TRANSPORTATION ISSUES WITH NRC AND DOT REPRESENTATIVES.

THIS CONCLUDES MY PREPARED REMARKS, MR. CHAIRMAN. MY FELLOW COMMISSIONERS AND I WOULD BE PLEASED TO ANSWER QUESTIONS AT THIS TIME.

I. NRC Role in Repository Development Program

Provision	Current NWPA Date	Schedule	NRC Role
1 Section 112(a)-Siting Guidelines promulgated by DOE in which NRC concurs	7/6/83	Completed 12/84	NRC must concur in DOE Guidelines. Current Status - The Commission voted to concur on the guidelines on June 22, 1984 DOE published the final guidelines on December 6, 1984
2 Section 121(b)-NRC must promulgate technical requirements and criteria	1/1/84	Promulgated 6/21/83	NRC must issue regulations which specify the technical requirements and criteria for the repository. Current Status - The regulations were published in the Federal Register on June 21, 1983 (48 FR 28194).
3 Section 121(a)-EPA final high-level waste standards promulgated	1/7/84	Promulgated 9/19/85	Section 121(b) regulations and criteria must be revised by the Commission, if necessary, to comply with standards being prepared by EPA. Current Status - EPA published the final standards in the Federal Register Thursday, September 19, 1985 (50 FR 38066). The EPA Standards will become effective Novmeber 16, 1985. NRC will now review its high level waste criteria for conformance with EPA standards.

1. NRC's Role in Repository Development Program ,

Provision	Current NWPA Date	Schedule	NRC Role
4. Section 114(e)-DOE Project Decision Schedule.	None Specified	Draft received on July 18, 1985	NRC must coordinate with DOE on the development of the Project Decision Schedule. Current Status - The Commission approved the comments with modifications on September 19, 1985; they were provided to DOE October 24, 1985.
5. Sections 216(a) and 301(b)- Draft Mission Plan published by DOE.	4/7/84	Published 5/84	NRC must coordinate with DOE on the development of the Mission Plan, and specify, with precision, any objections to the Plan. Staff comments on the draft Mission Plan were signed by the Chairman and forwarded to DOE on July 31, 1984.
6. Section 301(b)-Submission of DOE Mission Plan to Congress.	6/7/84	Completed on July 9, 1985	Following Congressional approval of the Mission Plan, NRC will, wherever necessary, conform its waste management program planning guidance to the Plan. Current Status- DOE submitted the Final Mission Plan to Congres July 9, 1985. The NRC will forward its comments to DOE for updates to the Mission Plan.
7. Section 117(a)-Provision of information to States/Tribes.	In a timely manner	Ongoing	NRC must provide timely and complete information regarding its determinati or plans made regarding siting, development, or design for licensing, construction, operation, regulation, or decommissioning. NRC has been hol meetings with State and Tribal officials to exchange information.

I. NRC's Role in Repository Development Program

Provision	Current NWPA Date	Schedule	NRC Role
8. Section 112(b)-DOE recommends to the President 3 sites for characterization for first repository. Each of the 5 sites initially nominated for characterization must be accompanied by an Environmental Assessment.	1/1/85	Site recommendation 11/85	DOE will develop draft EA's on sites under consideration for nomination after Commission concurrence on the siting guidelines. NRC staff intends to review and comment on EA's. DOE issued draft Environmental Assessments for nine potential repository sites on December 20, 1984, and proposed to recommend sites in Nevada, Texas, and Washington for characterization. The NRC review was completed on March 20, 1985. Current Status - According to the Draft Project Decision Schedule, DOE currently plans to publish final EAs and nominate and recomm sites at the end of 1985.
9. Section 8-President must evaluate the possibility of developing a defense-waste only repository.	1/7/85	4/30/85	DOE submitted a final report to the President in February 1985, recommending a combined commercial and defense repository. On April 30, 1985, the President found no basis that a defense-only repository is needed and agrees with DOE recommendation of combined repository.
10. Section 113(b)-Submission to NRC by DOE of site characterization plan (SCP), waste form or package description, and conceptual repository design for each site.	Before sinking shafts	3/86 10/86	NRC must review and comment on the submitted materials. Current Status- DOE official schedules for SCP submittal are for BWIP and NNWSI in March 1986, and Salt in October 1986.
11. Section 114(a)(1)(E)-DOE submits to the President and the public the Commission's preliminary comments concerning at-depth sufficiency for DOE construction authorization application.	Prior to 13. below	Prior to 13. below	NRC must provide preliminary comments on the adequacy of the at-depth site characterization and waste form sufficiency for DOE construction authorization application.
12. Section 114(a)(1)(D)-DOE's final Environmental Impact Statement (EIS) EIS.	Prior to 13. below	12/90	NRC must review and comment on the draft EIS, which is scheduled to be iss 6/90.

I **NRC's Role in Repository Development Program**

Provision	Current NWPA Date	Schedule	NRC Role
13. Section 114(a)(2) President recommends one site to Congress for construction	March 31, 1987 (may be extended one year if necessary)	3/91	N/A

I. NRC' Role in Repository Development Program

Provision	Current NWPA Date	Schedule	NRC Role
14. Sections 116(b) and 118(a)-Submission of notice of disapproval by State or Indian tribe.	May 30, 1987 (or May 30, 1988 if #13 is extended)	1991	N/A, see 15 below
15. Section 115(g)-Congress may obtain any comments of the Commission with respect to a State/Tribal site disapproval.	Prior to 16 below	Prior to 16 below	NRC must be cognizant of State/Tribal concerns to be able to provide knowledgeable comments to Congress.
16. Section 115(c)-State/Tribal disapproval will take effect unless both Houses of Congress pass resolution of approval with in 90 calender days of continuous session	About 8/87 (or 8/88 if #13 is extended)	1991	N/A, see 15 above
17. Section 114(a)(3)-Within 1 year after disapproval, the President must recommend an alternative site for the first or a subsequent repository	8/88 (or 8/89)	1992	Role similar to initial site recommendation. See events 11-15, above.
18. Section 114(b)-Secretary submits construction authorization application (i.e. license application) to NRC	8/87 (or 8/88)	5/91	An NRC licensing proceeding will be initiated on the license application.
19. Section 114(c)-NRC must submit status report to Congress.	One year after submittal of the license application and annually thereafter	5/92	NRC must submit an annual status report on the progress of the licensing proceeding to Congress.

I NRC's Role in Repository Development Program

Provision	Current NWPA Date	Schedule	NRC Role
20 Section 114(d)-Commission must issue decision on construction authorization (CA) for first repository.	1/1/89 or 3 years after application submitted, or 4 years after submittal (if extended)	8/93	Commission is required to either grant or deny authorization for DOE to begin construction of the first geologic repository within 3 years of the application submittal. NRC believes that 36 months for a licensing decision is a very optimistic estimate and has identified various measures by which both NRC and DOE can facilitate the 36 months license review schedule by resolving issues early
21. Section 112(b)(1)(c)-Secretary must recommend 3 sites for characterization to President for second repository.	7/1/89	10/91	Same as event 8 above. Current Status - NRC review of the DOE Crystalline Program is continuing at a minimal level of effort through FY88
22. Section 114(a)(2)(A)-President must recommend to Congress 1 site, from sites already characterized, for second repository	3/31/90 (may be extended one year)	1/98	Same as events 10, 11, and 12 above.
23. Section 114(b)-Submission of construction authorization application to NRC for second repository	About 11/90	5/98	NRC will initiate licensing proceeding for second repository
24. Section 114(d)-Commission must issue decision on issuing construction authorization for second repository	1/1/92 or 3 years after application submitted, or 4 years after submittal if extended	8/2000	See # 20 above.

II. NRC's Role in the Test and Evaluation Facility Program

Provision	Current NWPA Date	Schedule	NRC Role
25. Section 213(a)- DOE is authorized but not required to issue T&E facility siting guidelines	7/7/83	DOE has not announced	DOE to consult with NRC concerning the guidlines. Current Status - No guidelines have been issued. NRC will provide the required consultation if and when the guidelines are issued.
26. Section 216(a)-TEF cooperation and coordination.	None specified		NRC shall assist the Secretary by cooperating and coordinating on any reports under Title II. Current Status- No action taken. DOE planning to make a determination on a collocated TEF in FY87
27. Section 217(f)(1)-NRC, DOE must conclude written agreement on procedures for T&E facility interaction.	1/6/84	Not scheduled	NRC must work with DOE in developing a written agreement for procedures for review, consultation, and coordination in the planning, construction and operation of the T&E facility. Such an understanding shall also establish the types of reports and other information as the Commission may reasonably require to evaluate health and safety impacts of the T&E facility. Current Status- No agreement has been reached. DOE reported to Congress on April 6, 1984 their decision that if a TEF is necessary, it should be collocated, but that the decision on the need for a TEF is being delayed until the program's data needs are better established, now planned for late 1987
28. Section 217(f)(1)(A)-NRC shall carry out a continuing analysis of the T&E activities to evaluate the adequacy of the consideration of public health and safety issues.	None specified		As provided
29. Section 217(f)(3)(B)-NRC required to report to the Secretary, the President, and the Congress as it deems appropriate	None specified		As provided

II. NRC' Role in the Test and Evaluation Facility Program

Provision	Current NWPA Date	Schedule	NRC Role:
30. Section 217(h)-NRC must concur on decontamination and decommissioning of DOE's T&E facility.	Five years after initial operation		NRC will evaluate DOE's decontamination and decommissioning activities, and concur, if deemed appropriate for a T&E facility not located at the site of repository.

III NRC's Role for Interim Spent Fuel Storage

Provision	Current NWPA Date	Schedule	NRC Role
31. Section 132-The Secretary, the Commission, and other authorized federal officials shall each take such actions as such officials consider necessary to encourage and expedite the effective use of available storage, and necessary additional storage, at the site of each civilian nuclear power reactor.	No specific dates		The Commission will consider which actions are necessary to implement the intent of this provision.
32. Section 134-Hybrid procedures are prescribed for hearings on certain applications for licenses for facility expansions of spent fuel storage capacity and transshipments of spent fuel.	No specific dates, but applicable to applic filed after 1/07/83	Final rule sent to Comm July 8, 1985	The Commission is to provide hearings on procedures for onsite expansion of spent fuel storage capacity or transshipment of fuel. Current Status - The Commission approved the final rule on September 5, 1985, and the final edited rule was published in the Federal Register October 15, 1985.
33. Section 135(g)-Issuance of NRC proposed rule establishing procedures and criteria for making a determination that onsite storage cannot reasonably be provided at a reactor and that the person owning and operating the reactor is diligently pursuing licensed alternatives to the use of federal storage capacity.	4/7/83	Final criteria published 2/11/85	As provided. Current Status - The final rule, 10 CFR Part 53, was published February 11, 1985, establishing procedures and criteria for making NRC's determination that a utility is eligible to contract with DOE for federal interim storage capacity.

III. NRC's Role for Interim Spent Fuel Storage

Provision	Current NWPA Date	Schedule	NRC Role
34. Section 135(a)-If the NRC determines that onsite storage cannot reasonably be provided at a reactor by the licensee, DOE may, under certain conditions, provide not more than 1900 metric tons of capacity for storage of spent nuclear fuel from civilian power reactors.	Not specific		NRC will make public health and safety determinations as to the use of any existing DOE facility for spent fuel storage and will license storage in new structures, including modular or mobile spent nuclear fuel storage equipment such as dry casks, as required under this provision of the Act
35. Section 137(a)-Transportation of spent nuclear fuel to a DOE storage facility shall be subject to licensing and regulation by NRC and by the Department of Transportation.	Not specific		NRC is required to review DOE's applications for shipment and make licensing determinations for health and safety and safeguards
36. Section 137(b)-DOE, in providing for the transportation of spent nuclear fuel under this Act, shall utilize by contract private industry to the fullest extent possible in each aspect of such transportation	Not specific		NRC will be required to review the private contractor's application for shipment, and make licensing decisions for health and safety and safeguards. Regulations may, at a future date, be modified or revised to conform with DOE's repository program

III NRC's Role for Interim Spent Fuel Storage

Provision	Current NWPA Date	Schedule	NRC Role
37. Section 218(a) and 133-NRC shall by rule establish procedures for the licensing of any technology approved by the NRC for use at the site of any civilian nuclear power reactor. NRC may by rule approve one or more dry spent fuel storage technologies for use at the sites of civilian power reactors without, to the maximum extent practicable, the need for additional site specific approvals.	Not specific		NRC, using data and information from DOE dry storage demonstration and cooperative programs, will develop regulations to approve dry technology storage at civilian nuclear power reactors without, to the maximum extent practicable, the need for additional site specific approvals by the NRC.
38. Section 216(a)-Interim Spent Fuel Storage Cooperation and Coordination.	None specified		NRC shall assist the Secretary by cooperating and coordinating on any reports under Title II.

IV NRC's Role in Monitored Retrievable Storage Program

Provision	Current NWPA Date	Schedule	NRC Role
39. Section 141(b)(3)-DOE shall consult with the Commission and EPA in formulating the MRS proposal and shall submit their comments on the MRS proposal to Congress along with the proposal.	6/1/85	1/15/86	NRC is consulting with DOE on development of the MRS proposal, and will provide comments to DOE for submittal with the proposal to Congress. In the draft PDS, DOE plans to issue the MRS proposal to NRC in 11/85 and to submit MRS proposal to Congress 1/15/85.
40. Section 141(c)(1)-Submission by Secretary of an environmental assessment with respect to the MRS proposal to Congress.	6/1/85	1/15/86	NRC may, if it deems appropriate, comment to DOE on this environmental assessment (EA).
41. Section 141(d)-DOE shall file for license with NRC for MRS.	Subject to Congressional authorization of MRS	Subject to Congressional authorization of MRS	If authorized, NRC will review DOE's application and make the necessary licensing determinations.

V. **NRC Role in the Low-Level Waste Management Area**
(No deadlines were provided in the Act for the LLW management provisions under Section 151)

Provisions	NRC Role
42. Section 151(a)(1)-Commission authorized to establish regulations or other such standards and instructions as it deems necessary or desirable to ensure that each LLW disposal licensee will have adequate financial arrangements for decontamination, decommissioning, site closure and reclamation of sites, structures, and equipment used in conjunction with its LLW disposal.	New sites are covered by existing regulations (10 CFR Part 61). NRC will review existing regulations and guidance for application at the existing commerical LLW disposal sites.
43. Section 151(a)(2)-If Commission determines that long-term maintenance or monitoring will be necessary at a LLW disposal site, Commission must ensure before termination of the license that the licensee has made adequate financial arrangements. Monitoring will be carried out by the person having title and custody for such following license termination.	May require rulemaking by the Commission and the development of guidance for both existing and new commercial LLW disposal sites. For existing sites, analyses will be required to assess long-term performance, monitoring and long-term maintenance requirements, associated costs, and the programs to review monitoring data to identify the need for mitigative actions.
44. Section 151(b)-DOE shall have the authority to assume title and custody of LLW and the land on which such waste is disposed of, upon the request of the owner of such waste and land following termination of the license issued by the Commission for such disposal, if 1) the Commision determines that the requirements for site closure, decommissioning and decontamination have been met with pursuant to Section 115(a), 2) that such title and custody will be transferred to the DOE without cost to the Federal government; and that Federal ownership and management is necessary, or desirable to protect the public health and safety.	Likely to require rulemaking/guidance to provide basis for required determinations. Such rulemaking/guidance would require close coordination of DOE which appears to have independent discretion to accept sites following Commission determination.

Provisions	NRC Role
45. Section 151(c)-Adequate financial arrangements for long-term maintenance and monitoring, as well as decontamination and stablization of special sites must be met in accordance with requirements established by the Commission before DOE may assume title and custody of the waste and the land on which it is disposed.	Similiar to event 44 above

VI. NRC's Role Relating to Other Provisions in the Act

Provisions	Current NWPA Date	Schedule	NRC Role
46. Section 223(b)-By April 7, 1983, DOE and NRC must publish a joint notice in the Federal Register stating that the U.S. is prepared to cooperate and provide technical assistance to non-nuclear weapon states in the field of spent fuel storage and disposal.	4/7/83 Annual revisions required	Completed 3/30/83. Updates published April 6, 1984, April 5, 1985	NRC will prepare a joint Federal Register notice with DOE and will provide technical assistance to non-nuclear weapon states pursuant to the Act and the FR notice. NRC and DOE will update and reissue this notice annually for 5 years, as required. An FR notice was published following coordination with DOE, ACDA, and the State Department on March 30, 1983. The first annual update of the notice was published in the Federal Register on April 6, 1984. Current Status- This year's update was published in the Federal Register on April 5, 1985.
47. Section 302(b)(1)(A)-The Commission shall not issue or renew a license to use a utilization or production facility under Section 103 or 104 of the Atomic Energy Act unless the applicant has entered into a waste disposal contract with the Secretary of Energy or the Secretary affirms in writing that the licensee is negotiating in good faith to enter into such a contract.	6/30/83		The final waste disposal contract proposal was published by the DOE in the Federal Register on April 18, 1983. All necessary contracts were signed and received by the DOE on or before the June 30, 1983 statutory deadline
Section 302(b)(1)(B)-The NRC in its discretion may require as a precondition to the issuance or renewal of a reactor license that the applicant shall have entered into an agreement with DOE for the disposal of high-level waste or spent fuel that may result from such a license.			

Provision	Current NWPA Date	Schedule	NRC Role
48. Section 303-DOE shall consult with the Chairman of the NRC in conducting a study of alternative approaches to managing construction and operations of all civilian waste management facilities, and then DOE is to report to Congress.	1/6/84	Action Completed 4/18/85	At the invitation of the Secretary, the Chairman will consult on the "alternative approaches" study. Actions Taken-DOE chartered an Advisory Panel on Alternative Means of Financing and Managing Radioactive Waste Facilities (AMFM) to assist them in conducting the required study. The NRC transmitted comments to Secretary Herrington on March 22, 1985, which were forwarded to the President along with DOE's recommendations on April 18, 1985. DOE recommends retaining the present management structure at least through the siting and licensing phase of the program.

Provision	Current NWPA Date	Schedule	NRC Role
49. Section 306-NRC is required to promulgate regulations or other suitable guidance for the training and qualifications of civilian nuclear power plant personnel and submit a report to Congress on its activities under this action.	1/6/84	3/86	As provided. The Commission issued a policy statement on February 7, 1985, concerning personnel training and qualifications. This policy statement was published in the Federal Register on March 20, 1985. The Commission published proposed amendments to Part 55 dealing with simulator training requirements on November 26, 1984, the final amendment to Part 55 is expected in March 1986.

STATEMENT BY COMMISSIONER JAMES K. ASSELSTINE
U.S. NUCLEAR REGULATORY COMMISSION
BEFORE THE
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
OCTOBER 30, 1985

Mr. Chairman, I would like to add a few comments on the issue of the timing of the preliminary determination of site suitability under section 114 (f) of the Nuclear Waste Policy Act. I believe there are four relevant questions regarding the timing of the preliminary determination. First, was there an agreement between the Commission and DOE on the timing of the preliminary determination at the time of the Commission's concurrence in DOE's site selection guidelines? Second, was this agreement a condition of the Commission's concurrence in the site selection guidelines? Third, is the DOE's change in position on the timing of the preliminary determination a matter exclusively within DOE's program management discretion, or does the NRC have a regulatory interest in this matter as well? And finally, should the preliminary determination of site suitability be made before or after site characterization?

The first question arises because during the Commission's July 29, 1985 meeting with DOE to discuss the Department's mission plan for the high-level waste disposal program, the Department took the position that there had not been an agreement between DOE and NRC on the timing of the preliminary determination at the time of the Commission's concurrence in the site selection guidelines. DOE expressed the view that it had been the Department's position all along that the timing of the preliminary determination should be deferred until a later date. I think it is clear. Mr. Chairman, that there was an agreement in June 1984 between DOE and NRC that the preliminary determination should be made after rather than before site characterization. This agreement was clearly stated in the Commission's July 10, 1984 decision which concurred in the DOE site selection guidelines. DOE did not object to the Commission's characterization of the agreement at that time. Moreover, the transcript of the Commission's discussions with DOE on the site selection guidelines on June 22, 1984 contains clear statements by DOE that the preliminary determination of site suitability should be made after completion of site characterization. During that meeting, DOE acknowledge that the preliminary determination should be made after site characterization because that is the point in time when enough data about the site is available to make the preliminary determination a meaningful statement. Mr. Chairman, I have attached to my statement excerpts from the transcripts of the June 22, 1984 and July 29, 1985 Commission meetings as well as the Commission's July 10, 1984 concurrence decision.* I believe these documents clearly show that there was an agreement between DOE and NRC on the timing of the preliminary determination, and that this agreement was based upon a judgment that site characterization was necessary to obtain the technical information needed to support the preliminary determination of site suitability.

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*The transcripts referred to have been retained in committee files. The concurrence decision appears in the July 10, 1984 issue of the Federal Register, at page 28130. The copy appended to this statement has been retained in committee files.

On the second question, I believe it is also clear that the agreement between DOE and NRC on the timing of the preliminary determination was a condition of the Commission's concurrence in the DOE site selection guidelines. My colleagues place great weight on the fact that the Commission failed to label the agreement as a "concurrence condition" in the July 10, 1984 Commission decision, and did not insist that the agreement be written into the guidelines themselves. The fact remains, however, that the Commission included the agreement in the concurrence decision and required that a statement calling for the preliminary determination to be made before site characterization be removed from the guidelines. The context in which the Commission's concurrence decision was made further supports the interpretation that the agreement was a condition of concurrence. Despite all of the Commission's other conditions of concurrence, which had been published for comment, the affected states remained unanimously opposed to the DOE site selection guidelines. They argued that despite NRC's other proposed concurrence conditions, the site selection guidelines were too vague and failed to specify the type and amount of information needed to determine whether the guidelines were met. As the transcript of the Commission's June 20, 1984 meeting clearly shows, the unanimous opposition by the states to the guidelines was a matter of great concern to the Commission, and the agreement on the timing of the preliminary determination was the means chosen by the Commission to address these state concerns and permit Commission concurrence in the guidelines.

On the third question, I believe that the Commission has a direct regulatory interest in the timing of the preliminary determination and that this is not a matter within DOE's exclusive discretion. The Commission's regulatory interests in this issue are threefold. First, the Commission has the statutory responsibility under the Nuclear Waste Policy Act to concur in the DOE site selection guidelines. The purpose of this concurrence responsibility was to provide an independent check of DOE's site screening and site selection process. As I discussed previously, the Commission determined that the preliminary determination should be made after rather than before site characterization to ensure an effective site selection process. The states pointed out flaws in DOE's site selection guidelines, and the Commission's decision on the timing of the preliminary determination was an attempt to compensate for these flaws.

Second, the Commission has a direct stake in ensuring that DOE's site selection process works effectively to identify good sites that have a high potential as candidates for repository development, and to screen out poor or marginal sites or sites with features that may make it difficult to demonstrate their suitability for repository development. In a very real sense, the quality of DOE's license application and the prospects for an efficient and successful licensing proceeding depend upon how well DOE does its job in selecting sites for characterization. We simply cannot afford to allow DOE to proceed with a weak or flawed site selection process that permits the selection of poor, marginal or unduly complex sites.

Third, the Commission has an independent legal responsibility under the National Environmental Policy Act to consider alternate sites for the repository in its licensing review of the DOE application. While the

Nuclear Waste Policy Act puts some bounds on NRC's NEPA review, it does not discharge the Commission from its legal responsibility to consider alternate sites in making its license decision on the DOE application for the repository.

Given these three regulatory interests, the timing of the preliminary determination is, both as a legal and a technical matter, an integral part of the Commission's licensing and safety responsibilities under the NWPA and NEPA.

On the fourth question, I believe there are four reasons why the preliminary determination of site suitability should be made after rather than before site characterization. First, I believe that DOE's current approach is legally impermissible under the Nuclear Waste Policy Act. While the statute is not entirely clear on the subject and while the legislative history is somewhat limited given the absence of a conference on the House and Senate bills, I believe that the better legal view is that DOE cannot make the preliminary determination before obtaining the detailed information about key site characteristics, including the geology, that will become available through site characterization.

Second, from a technical standpoint, it makes no sense to make the preliminary determination of site suitability before site characterization. As the states have pointed out to the Commission, there is very limited information on many of these sites at the present time, particularly concerning geology and hydrology. Our technical staff has advised us that there are significant uncertainties about the key characteristics of each of these sites given the limited information that is available now. As a practical matter, this information is not sufficient to support a determination of site suitability for repository development.

Third, making the preliminary determination before site characterization thwarts the purpose of the statutory provision, which was to ensure the consideration of reasonable alternatives.

By permitting one or two of the sites selected for characterization to drop out perhaps early in the site characterization process and by eliminating the requirement to examine other sites in detail before selecting the site for the first repository. the DOE approach in effect make the consideration of alternate sites under NEPA a meaningless exercise.

Finally, making the preliminary determination after site characterization, or at least after substantial site characterization work is done, strengthens the site selection process. It provides a strong incentive for DOE to select good potential sites and it assures that the site suitability determination considers the full range of relevant site characteristics, including geologic factors. Making the preliminary determination of site suitability before site characterization, as DOE proposes, will mean that some significant factors, such as the geology and hydrology of the site, will be given little weight due to the limited information available on these characteristics. This approach undermines the validity of the site selection process. For these four reasons, I believe that the preliminary determination of site suitability should be made after rather than before site characterization. Thank you.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

February 21, 1986

The Honorable Robert T. Stafford, Chairman
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

In the October 30, 1985, Committee hearing on high-level radioactive waste, Senator Moynihan requested the NRC to consider the question of the 1998 deadline in the Nuclear Waste Policy Act (NWPA), and to advise the Committee as to whether the 1998 deadline is conducive to the best outcome of the program or whether this date should be reconsidered by Congress. The enclosed Insert-For-The-Record is in response to that request. We have also included the answers to the five post-hearing questions submitted to us for consideration.

If I can be of further assistance, please contact my office.

Sincerely,

Edward Fay

f Carlton Kammerer, Director
Office of Congressional Affairs

Enclosure:
As stated

cc w/o enclosures:
Sen. Lloyd Bentsen
Sen. Daniel Moynihan

INSERT FOR THE RECORD
OCTOBER 30, 1985 HEARING ON HIGH-LEVEL RADIOACTIVE WASTE
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

At the hearing before the Senate Committee on Environment and Public Works held on October 30, 1985, concerning the high-level radioactive waste program, a question was raised about the 1998 deadline in the Nuclear Waste Policy Act (NWPA), P.L. 97-425, for disposing of waste. Specifically, the Commission was asked whether the 1998 fixed deadline is conducive to the best outcome of the high-level waste program or whether this date should be reconsidered by Congress.

Based upon our review of the DOE Mission Plan and DOE's ongoing progress, we believe the schedules in the Mission Plan are aggressive and optimistic. However, we do not believe that use of the 1998 deadline as a target date is reason for concern at this time. It is significant to note in DOE's testimony to the Committee that it does not intend to take shortcuts on safety-related items in order to meet schedules. The Commission believes this is a very important commitment.

We believe it is especially important for DOE to take the time it needs in developing its detailed plans for site characterization to assure that site characterization work will indeed be complete. Also, as we testified, taking the time to get quality assurance programs fully in place prior to the start of site characterization is essential to a timely licensing decision.

The Commission believes that it will be possible to provide a better assessment of the 1998 deadline following review of DOE's detailed site characterization plans which are scheduled for completion in 1986.

Consistent with DOE's testimony, the Mission Plan reflects slips by DOE in schedules for early milestones in the program in order to allow more careful deliberation in the process of repository siting and development. The 1998 deadline and these slips have led to a compression in Mission Plan schedules for site characterization and licensing. As we testified, we know of no specific actions which could permit compressing licensing schedules. In the October 30th hearing, DOE announced a further slip in its schedules for selecting sites for site characterization. As a result of these points we believe that DOE's reference schedule in the Mission Plan is optimistic. DOE recognizes this, however, and has presented alternative schedules in the Mission Plan. (The NRC staff has prepared a more detailed analysis of DOE's progress thus far. We have appended this analysis for your consideration.)

Irrespective of the date selected, the Commission will not permit any deadline to compromise what we believe is necessary to provide reasonable assurance that the public health and safety will be protected.

Commissioner Asselstine has the following additional comment:

I continue to be concerned that the 1998 deadline for repository operation appears to be the controlling factor in setting the schedules for intermediate steps in the repository development process. The effect of this deadline, when coupled with the delays experienced in accomplishing early repository activities, is to compress substantially the time available for site characterization and licensing. The success or failure of the repository program is likely to depend in large measure on the adequacy of the site characterization and licensing steps. The schedule of these steps must be sufficient to permit a thorough exploration of all safety and environmental issues. The Commission has already informed DOE and the Congress that DOE's proposed schedule for the repository licensing process is too tight. DOE's site characterization plans will provide a basis for evaluating the adequacy of DOE's timetable for site characterization activities. When DOE submits its site characterization plans, I believe the Congress should review the adequacy of DOE's proposed schedules for site characterization and licensing and make whatever adjustments to the schedule that are needed to assure a thorough and effective review of the issues.

NRC STAFF ANALYSIS
OCTOBER 30, 1985 HEARING
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
QUESTION CONCERNING THE 1998 DEADLINE FOR HIGH-LEVEL RADIOACTIVE WASTE DISPOSAL IN THE NUCLEAR WASTE POLICY ACT
[P.L. 97-425]

During the October 30, 1985, hearing with the Senate Committee on Environment and Public Works, Senator Moynihan asked the Commission in a formal way to consider the question of the 1998 deadline in the Nuclear Waste Policy Act (NWPA) and to advise the Committee, in their collective and individual judgment, whether that ought to be a fixed deadline or whether Congress ought to look at that legislation again. The Senator further asked for the Commission's judgment "...about whether the fixed deadline is conducive to the best outcome..." The Chairman replied that he also thought "...there is a related question of is this date absolutely necessary to be met?" Senator Moynihan then questioned whether the Commission agreed that "The date can serve some purposes and not others. It may lead you to make decisions which you are really not confident with. We are talking 10,000 years, so we can take as much time as is needed to make the judgement. Would you agree with this?" Senator Stafford thought it would be interesting to have some data from the Commission.

The events leading up to repository operation are presented in DOE's Mission Plan for the Civilian Radioactive Waste Management Program (DOE/RW-0005), which was submitted to Congress in June 1985. In Section 3.1.7 of the Mission Plan, DOE considered possible alternatives for completing these activities and estimated completion times for each alternative. Enclosed is the summary of the alternatives which appear in the Mission Plan. If the DOE estimate for the maximum duration of each phase of repository development is assumed, the 1998 deadline could be extended by 20 years, to 2018. It has been the Commission's position in the past that the NRC's high-level waste management program is to be directed to an effective and efficient discharge of NRC's responsibilities under the NWPA based on the premise that, in the absence of unresolved safety concerns, and assuming sufficient resources, the NRC regulatory program will not delay implementation of the Executive Branch's program as reflected in the DOE Project Decision Schedule (NWPA Section 114(e)). However, in no case will the NRC make its decision in the face of unresolved safety concerns, just to satisfy milestone dates. DOE has stated before the Senate Committee on the Environment and Public Works, that it does not intend to take shortcuts on safety in order to meet schedules. The staff considers this to be a very important commitment on the part of DOE.

EXPERIENCE

We note that several early milestones specified in the Act have not been met. Key examples of this include the Repository Siting Guidelines (due 7/6/83, completed 12/84), the Mission Plan (due 6/7/84, completed 7/9/85), and the Secretary's recommendation to the President of three sites for characterization by 1/1/85 (expected in the spring). It should be noted that these activities involved parallel efforts in setting up new activities within DOE. The DOE was in a start-up situation involving staffing and organizing. The Nuclear Waste Policy Act of 1982 (NWPA) had been signed into law on January 7, 1983. The Office of Civilian Radioactive Waste Management (OCRWM) was formally created in September 1983 to carry out the functions of DOE under the Act. The first official Director of OCRWM, Ben Rusche, was confirmed in May 1984. Mr. Rusche was preceded by two acting directors, Robert Morgan and and Michael Lawrence. The failure to meet early milestones may be due at least partially, to the startup situation. We do not believe these early failures to meet schedules portend a continuing inability to meet schedules.

CURRENT PLANNING

Recognizing delays in meeting early milestones, DOE in the optimum schedule of its draft Project Decision Schedule (PDS) has established schedules to complete future milestones to ensure meeting the 1998 commitment that appears in both the Act and DOE contracts with the utilities. For example, in the draft PDS, DOE has proposed a nine month reduction in the statutory duration of the NRC review of the repository license application (from 36 months to 27 months). The Commission informed DOE that it continued to believe that the three year period provided by the NWPA is a very optimistic estimate for the time required to reach a decision on repository construction, and that any possibility that this review period can be met depends on DOE submitting a complete and high quality license application. Both NRC and DOE are seeking ways to reduce the time, without sacrificing quality, for the license decision. Thus far, NRC has not identified what we believe to be a significant time saving practice under the current program. The Commission has identified six key actions that DOE would need to complete to make the 36 month review more probable. We have had general agreement by DOE management on these six actions. Because these actions will take DOE some time to fully implement, the uncertainty that the review can be accomplished within 36 months continues to exist. We note here that in the NRC comments on the various bills leading up to the NWPA, we took the position that the staff required at least 42 months to reach a decision on DOE's repository license application. The act provides for NRC's review to be completed within 36 months, extendable to 48 months.

We believe another area of current uncertainty in planning is the time actually allotted in DOE's optimum schedule for completion of in-situ testing once the exploratory shafts have been sunk at the sites where site characterization is to be performed. It appears, based on our knowledge of the sites being considered by DOE, that the optimum schedules in the Mission Plan for site characterization are optimistic. However, the details of what DOE intends to accomplish in site characterization will not be known until DOE publishes its Site Characterization Plans.

Concerning the question of whether it is absolutely necessary for the 1998 deadline to be met, there do not appear to be any technical reasons why a repository would have to be operational by then. There are acceptable ways that these wastes can be safely managed for periods beyond 1998. However, the unavailability of a geologic repository beyond 2007-2009 may have legal implications. The Commission addressed the question regarding the date for repository availability in its 1984 Waste Confidence decision [49FR34658], stating that it found "reasonable assurance that one or more mined geologic repositories for commercial high-level radioactive waste and spent fuel will be available for the years 2007-2009...". The Commission's Waste Confidence decision is unavoidably in the nature of a prediction and recognizes that the possibility of significant unexpected events remains open. The Commission will review its conclusions on waste confidence should significant and pertinent unexpected events occur, or at least every five years, until a repository for high-level radioactive waste and spent fuel is available.

CONCLUSION

The NRC believes that programmatic milestones such as those included in the NWPA are useful in ensuring focus on the program. The commitment of management of both the NRC and DOE not to allow schedules to degrade attention to safety is an important safeguard in this program.

A better judgement by the NRC on whether the 1998 deadline in the NWPA should be reconsidered, can better be made after the review of the Site Characterization Plans that DOE will be submitting as required by NWPA Section 113. (DOE will be taking this action regardless of whether an MRS is authorized by Congress). At that time, the Environmental Assessments (Section 112) will have been issued, and it may be possible to evaluate whether judicial review of these documents is likely to result in program delays. Also at that time, DOE will have narrowed the number of sites from the current nine to the three it intends to characterize, these sites will have been approved by the President, and the testing programs to reduce the technical uncertainties at the recommended sites will be available. These plans will show for the first time the data needs that DOE has identified and the amount, kinds, and duration of testing that DOE considers necessary to support licensing decisions. This will allow assessments to be made of the duration of site characterization, the timing of the Presidents recommendation of a repository site to congress (NWPA date for this action is March 31, 1987) the timing of the license application, and whether subsequent NWPA milestones can be met.

Table 3-2. The Reference Schedule and Possible Alternatives for Completing the Major Program Phases for the First Repository

REF. DOE/RW-0005; MISSION PLAN FOR THE CIVILIAN RADIOACTIVE WASTE MANAGEMENT PROGRAM; JUNE, 1985; Volume I, p.60

Major Program Phases	Recommend Sites for Characterization	Characterize Sites	Select Site and Obtain Site Approval	NRC Licensing Review	Construct and Test Repository
Reference schedule (start 12/84)	Secretary recommends 3 sites to President by November 1985. President approves sites in minimum time provided by Act (13 months)	Recommendation based, on in-situ testing (47 months)	President recommends site, no State or Indian tribe disapproval (17 months)	NRC review (27 months)	Phased construction, phase 1 complete in 53 months, phase 2 complete in 90 months
Alternative schedule cases and effect on reference schedule	1-A Extensive modifications required to draft EAs (+6 months)	2-A Recommendation based on surface studies and ES construction data only (-11 months)	3-A Additional DEIS review or extensive modifications required (+9 months)	4-A NRC review takes nominal period allowed by Act (+9 months)	5-A Construction delays (+24 months, each phase)
	1-B Secretary requires additional data to support site recommendation (+12 months)	2-B Site permitting delays (+9 months)	3-B State or Indian tribe disapproval submitted; Congress overrides (+5 months)	4-B NRC requires additional review time as allowed by Act (+21 months)	5-B Full-scale repository (+17 months for phase 1 -20 months for phase 2)
	1-C President requires additional review period allowed by the Act (+6 months)	2-C ES construction delays (+24 months)	3-C State or Indian tribe disapproval submitted, site disapproved, new site selected (+19 months)	4-C NRC requires extensive additional information (+33 months)	
		2-D Extensive in-situ testing required (+36 months)		4-D NRC rejects site; new site selected, approved, and CA issued (+48 months)	
Maximum phase duration	37 months	116 months	45 months	108 months	94 months until initial waste acceptance

Abbreviations: CA, construction authorization; DEIS, draft environmental impact statement, EAs, environmental assessments; ES, exploratory shaft.

QUESTION 1. THERE HAS BEEN MUCH DISCUSSION OF THE EFFORTS BEING MADE TO TRY AND KEEP TO THE SCHEDULES OUTLINED IN THE NUCLEAR WASTE POLICY ACT. OUGHT WE TO CONSIDER MODIFYING THESE SCHEDULES? PLEASE CONSIDER IN YOUR ANSWER THAT CONGRESS MAY OR MAY NOT APPROVE THE CONSTRUCTION OF A MONITORED RETRIEVABLE STORAGE FACILITY.

ANSWER.

NRC COULD PROVIDE THE CONGRESS BETTER INFORMATION ON THE SCHEDULES AND MILESTONES IN THE NWPA AFTER WE REVIEW THE DETAILED TECHNICAL PLANS AND SCHEDULES THAT DOE IS PREPARING AS REQUIRED BY NWPA (SECTION 113), REGARDLESS OF WHETHER OR NOT AN MRS IS AUTHORIZED BY CONGRESS. WE OBSERVE, HOWEVER, BASED UPON OUR REVIEW OF THE DOE MISSION PLAN AND THE PROGRESS BEING MADE BY DOE, THAT THE SCHEDULES ARE AGGRESSIVE. (SEE RESPONSE TO QUESTION 2.) THERE DO NOT APPEAR TO BE ANY TECHNICAL REASONS WHY A REPOSITORY WOULD HAVE TO BE OPERATIONAL BY THE NWPA DEADLINE OF 1998. THERE ARE ACCEPTABLE WAYS THAT THESE WASTES CAN BE SAFELY MANAGED FOR PERIODS BEYOND 1998, INCLUDING EXPANSION OF STORAGE CAPACITY AT THE REACTOR SITES USING ROD CONSOLIDATION AND/OR DRY STORAGE TECHNOLOGIES.

HOWEVER, IF A GEOLOGIC REPOSITORY WERE TO BE UNAVAILABLE BEYOND THE YEARS 2007-2009, THERE MAY BE LEGAL IMPLICATIONS RELATED TO THE COMMISSION'S WASTE CONFIDENCE DECISION. IN THAT DECISION THE

QUESTION 1. (CONTINUED)

COMMISSION STATED THAT IT WOULD REVIEW ITS FINDING OF "REASONABLE ASSURANCE THAT ONE OR MORE MINED GEOLOGIC REPOSITORIES FOR COMMERCIAL HIGH-LEVEL RADIOACTIVE WASTE AND SPENT FUEL WILL BE AVAILABLE FOR THE YEARS 2007-2009...," SHOULD SIGNIFICANT OR PERTINENT UNEXPECTED EVENTS OCCUR, OR AT LEAST EVERY FIVE YEARS, UNTIL A REPOSITORY FOR HIGH-LEVEL RADIOACTIVE WASTE AND SPENT FUEL IS AVAILABLE.

QUESTION 2. PLEASE EXPLAIN IN SOME DETAIL YOUR VIEWS ON THE PROPER TIME TO PERFORM CHARACTERIZATION FOR EACH POTENTIAL REPOSITORY SITE, AND THE NUMBER OF SITES FOR WHICH YOU BELIEVE CHARACTERIZATION OUGHT TO BE DONE.

ANSWER.

THE AMOUNT OF TIME NEEDED TO CONDUCT TESTS AND PERFORM SITE CHARACTERIZATION IS DEPENDENT ON THE SPECIFIC TECHNICAL ISSUES TO BE RESOLVED AND UNCERTAINTIES THAT EXIST AT EACH SITE. SHAFT CONSTRUCTION REQUIRES 1-2 YEARS. DOE WILL IDENTIFY THE REQUIRED TEST PROGRAM IN ITS SITE CHARACTERIZATION PLANS (SCP'S). BASED ON OUR KNOWLEDGE OF THE SITES BEING CONSIDERED BY DOE, IT APPEARS THAT THE MISSION PLAN SCHEDULES FOR SITE CHARACTERIZATION ARE OPTIMISTIC. HOWEVER, A BETTER BASIS FOR A JUDGMENT ON THIS MATTER WILL BE AVAILABLE FOLLOWING ANALYSIS OF DOE'S SCP.

REGARDING THE NUMBER OF SITES TO BE CHARACTERIZED, THE NWPA REQUIRES COMPLETION OF SITE CHARACTERIZATION OF AT LEAST THREE CANDIDATE SITES. THE CHARACTERIZATION OF ANY NUMBER OF SITES LARGER THAN THREE IS A PROGRAMMATIC MATTER THAT MUST BE DETERMINED BY DOE.

QUESTION 2. (CONTINUED)

COMMISSIONER ASSELSTINE ADDS:

COMMISSIONER ASSELSTINE BELIEVES THAT DOE SHOULD CONSIDER CHARACTERIZING FOUR SITES. HE BELIEVES THAT CHARACTERIZING FOUR SITES, WHEN COUPLED WITH A CAREFUL SITE SELECTION PROCESS, WILL PROVIDE GREATER ASSURANCE THAT THE REPOSITORY LICENSING PROCESS WILL PROCEED ON A REASONABLE SCHEDULE.

QUESTION 3. IN DISCUSSIONS OF HOW BEST TO DISPOSE OF LOW-LEVEL WASTES, IT HAS BEEN SUGGESTED THAT THE MOST RADIOACTIVE OF THE LOW-LEVEL WASTES (THE SO-CALLED C+ OR C WASTES) MIGHT BE HANDLED MOST APPROPRIATELY BY DISPOSAL IN A HIGH-LEVEL REPOSITORY. WHAT ARE YOUR VIEWS ON THE ADVISABILITY OF DOING SO? WHAT MIGHT BE THE PRACTICAL IMPACT, IF ANY, ON THE HIGH-LEVEL PROGRAM?

ANSWER.

THE COMMISSION IS AUTHORIZED UNDER NWPA [SEC. 2(12)(B)] TO DEFINE HIGH-LEVEL WASTE BY RULE. SOME WASTE, CURRENTLY CLASSIFIED AS LOW-LEVEL WASTE ABOVE CLASS C, MAY BE CLASSIFIED AS HIGH-LEVEL WASTE AS A RESULT OF THE COMMISSION'S RULEMAKING.

FROM A PUBLIC HEALTH AND SAFETY PERSPECTIVE, THE NRC WOULD NOT CONSIDER IT NECESSARY TO REQUIRE DISPOSAL IN A HLW REPOSITORY OF ABOVE CLASS C WASTES, IF SUCH WASTES ARE NOT DEFINED BY THE COMMISSION AS HLW. ANY DECISION TO DISPOSE OF ABOVE CLASS C WASTES IN A REPOSITORY WOULD BE BASED ON ECONOMIC OR INSTITUTIONAL, RATHER THAN SAFETY CONSIDERATIONS.

THE COMMISSION SEES NO TECHNICAL REASON TO EXCLUDE ABOVE CLASS C LOW-LEVEL WASTES* FROM DISPOSAL IN THE GEOLOGIC REPOSITORY PROVIDED THAT APPROPRIATE DESIGN MEASURES ARE TAKEN. FOR EXAMPLE, THESE WASTES WOULD HAVE TO BE PROCESSED AND PACKAGED SO THAT

QUESTION 3. (CONTINUED)

EMPLACEMENT IN A REPOSITORY WOULD NOT ADVERSELY AFFECT THE LONG-TERM, ISOLATION CAPABILITY OF THE REPOSITORY. WE NOTE THAT THE COMMISSION'S EXISTING REGULATIONS (E.G., 10 CFR 60.102) PERMIT THE DISPOSAL OF WASTE TYPES OTHER THAN HIGH-LEVEL WASTE IN A GEOLOGIC REPOSITORY.

PRACTICAL IMPACTS ASSOCIATED WITH DISPOSAL OF ABOVE CLASS C WASTES IN A HLW REPOSITORY WOULD INCLUDE EFFECTS ON THE LAYOUT AND DESIGN OF THE REPOSITORY AND THE NEED FOR ADDITIONAL WASTE PACKAGING/HANDLING FACILITIES. THE RECENTLY ENACTED LOW-LEVEL RADIOACTIVE WASTE POLICY AMENDMENTS ACT OF 1985 [P.L. 99-240] DIRECTS DOE TO PREPARE A COMPREHENSIVE REPORT ON DISPOSAL OF ABOVE CLASS C WASTES.

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* THIS RESPONSE RECOGNIZES THAT THE LOW-LEVEL RADIOACTIVE WASTE POLICY AMENDMENTS ACT OF 1985 [P.L. 99-240] GIVES RESPONSIBILITY FOR DISPOSAL OF CLASS C WASTES (AND BELOW) TO THE STATES AND ABOVE CLASS C LOW-LEVEL WASTES TO THE FEDERAL GOVERNMENT.

QUESTION 4. DO YOU BELIEVE THAT THE 1 MIL/KILOWATT HOUR SURCHARGE ON NUCLEAR ELECTRICITY WILL BE SUFFICIENT TO FUND THIS PROGRAM? HOW DO YOU CALCULATE THAT THIS MIGHT BE CHANGED UNDER PROPOSALS TO MODIFY THE PRICE-ANDERSON ACT THAT WOULD TAP THE NUCLEAR WASTE DISPOSAL FUND FOR COVERAGE OF DOE CONTRACTOR LIABILITY?

ANSWER.

THE NUCLEAR WASTE POLICY ACT OF 1982, SEC. 302(A)(4), [P.L. 97-425] REQUIRES DOE TO ANNUALLY REVIEW THE AMOUNT OF THE SURCHARGE ON NUCLEAR ELECTRICITY, TO EVALUATE WHETHER COLLECTION OF THE FEE WILL PROVIDE SUFFICIENT REVENUES TO OFFSET THE PROGRAM'S COSTS. THESE DOE REVIEWS HAVE IN THE PAST SUPPORTED THE SUFFICIENCY OF THE 1 MILL/KILOWATT HOUR SURCHARGE.

THE NRC DOES NOT HAVE THE CAPABILITY TO ASSESS INDEPENDENTLY ALL OF THE FACTORS NECESSARY TO MAKE A DETERMINATION OF THE ADEQUACY OF THE USER-FEE, AND BELIEVES THAT IT WOULD BE MORE APPROPRIATE FOR DOE TO RESPOND TO THESE QUESTIONS.

QUESTION 5. CONCERN HAS BEEN EXPRESSED ABOUT THE POTENTIAL PROBLEMS OF TRANSPORTING SPENT FUEL TO A REPOSITORY OVER SNOWY MOUNTAIN ROADS. TO THE EXTENT THAT YOU BELIEVE TRANSPORTATION IS A VALID CONCERN FOR THIS PROGRAM, DO NOT CONGESTED URBAN AREAS POSE COMPARABLE PROBLEMS FOR SAFETY AND SECURITY?

ANSWER.

NRC AND THE DEPARTMENT OF TRANSPORTATION SHARE RESPONSIBILITY FOR REGULATING SAFETY IN THE TRANSPORTATION OF RADIOACTIVE MATERIALS, AS SET FORTH IN A MEMORANDUM OF UNDERSTANDING (MOU) BETWEEN THE TWO AGENCIES (44 FR 38690). UNDER THE MOU'S TERMS, THE RESPONSIBILITY FOR SAFETY IN ROUTING SPENT FUEL SHIPMENTS RESTS WITH DOT, WHILE RESPONSIBILITY FOR SHIPMENT CONTAINER SAFETY AND PHYSICAL SECURITY RESTS WITH NRC. WE HAVE EVALUATED SHIPMENT EXPERIENCE AND TEST STUDIES. THE NRC IS CONFIDENT THAT IT IS EXTREMELY UNLIKELY THAT THE CONTAINERS WILL BE BEACHED IN AN ACCIDENT AND RELEASE A SIGNIFICANT QUANTITY OF RADIOACTIVE MATERIAL. HOWEVER, WE BELIEVE THAT STATE AND LOCAL AUTHORITIES MUST BE PREPARED TO RESPOND TO ACCIDENTS INVOLVING SPENT FUEL SHIPMENTS. THE EXISTENCE OF AN EMERGENCY RESPONSE CAPABILITY IS THEREFORE AN IMPORTANT CONSIDERATION IN EVALUATING THE IMPACT OF SPENT FUEL SHIPMENTS ALONG TRANSPORTATION CORRIDORS TO A HIGH-LEVEL REPOSITORY. PUBLIC CONCERNS OVER THE POTENTIAL FOR ACCIDENTS ON EITHER SNOWY MOUNTAIN

QUESTION 5. (CONTINUED)

ROADS OR IN CONGESTED URBAN AREAS NEED TO BE INCLUDED IN EVALUATING IMPACTS ALONG TRANSPORTATION CORRIDORS. IN NRC COMMENTS ON THE ENVIRONMENTAL ASSESSMENTS FOR THE NINE CANDIDATE SITES FOR THE FIRST HIGH-LEVEL WASTE REPOSITORY, WE ASKED DOE TO CONSIDER TRANSPORTATION CORRIDOR IMPACTS. DOT HAS ADDRESSED CONCERNS OVER ROUTE SAFETY IN ITS COMPREHENSIVE RULEMAKING FOR HIGHWAY ROUTING OF RADIOACTIVE MATERIAL (DOT DOCKET NO. HM-164). NRC HAS ADDRESSED THE QUESTION OF PHYSICAL SECURITY FOR SPENT FUEL SHIPMENTS AND HAS AN INTERIM REGULATION (10 CFR 73.37) IN PLACE. WE ARE CONSIDERING AMENDING THIS REGULATION TO TAKE INTO ACCOUNT NEW EXPERIMENTAL DATA FROM A SAFEGUARDS RESEARCH PROGRAM THAT INDICATES THAT THE HEALTH EFFECTS RESULTING FROM SABOTAGE OF A SPENT FUEL SHIPMENT WOULD BE MUCH SMALLER THAN THOSE ORIGINALLY ESTIMATED. FOR CERTAIN SPENT FUEL SHIPMENTS THESE AMENDMENTS WOULD PROVIDE CONTINUED PROTECTION AGAINST SABOTAGE AND RELIEVE THE LICENSEE OF NON-ESSENTIAL REQUIREMENTS. (SEE 49 FR 23867.)

STATEMENT OF
SHELDON MEYERS
ACTING DIRECTOR
OFFICE OF RADIATION PROGRAMS
U.S. ENVIRONMENTAL PROTECTION AGENCY

Before the
Committee on Environment and Pubic Works
October 30, 1985

Mister Chairman and Distinguished Members of the Subcommittee:

My name is Sheldon Meyers and since August 1984 I have been Acting Director of EPA's Office of Radiation Programs. I am pleased to be here today to discuss the standards EPA promulgated August 15, 1985 for the disposal of high-level radioactive wastes (HLW).

At the outset, let me emphasize that I have confidence now--and for many years have had confidence--that high-level wastes can and will be disposed of safely, and with the kind of exceptional care that will provide protection for present and future generations.

The Nuclear Waste Policy Act of 1982 established the roles of various Federal agencies in the disposal of highly-active radioactive wastes. The responsibility for the site selection, development and operation of these HLW sites is that of the Department of Energy (DOE); while the licensing of the repositories of HLW is the responsibility of the Nuclear Regulatory Commission (NRC).

The Nuclear Waste Policy Act assigned one specific responsibility to EPA as part of the National program: Section 121 requires EPA to promulgate "generally applicable standards for the protection of the general environment from off-site releases from radioactive material in repositories."

Today I would like to review for you what these standards cover and how we have approached some very significant issues. Finally I would like to address our relationship with DOE and NRC.

EPA first proposed these standards on December 29, 1982, just a few days before the Nuclear Waste Policy Act of 1982 became law. The Agency had been working on the standard for several years in the realization that they would be needed in a timely fashion as the National program took shape. Technically, they are called "Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level, and Transuranic Radioactive Wastes", 40 CFR Part 191. In other words, our standards apply to spent reactor fuel, the highly radioactive wastes derived from reprocessing spent fuel, and those transuranic wastes containing 100 or more nanocuries per gram and with half-lives of more than 20 years.

The standards do not apply to wastes which have already been disposed. Also our standards do not apply to ocean disposal of high-level waste which is prohibited by the London Dumping Convention.

Our standards do apply to both the management and disposal of the wastes.

In 1977 EPA promulgated its Uranium Fuel Cycle Standards (40 CFR Part 190) which covered commercial power-related operations from uranium milling through reprocessing. Subpart A of our new rule is a continuation of Part 190, and applies to high-level and transuranic waste management operations not covered in Part 190. These operations involve storage of the materials, solidification or other preparation for disposal, and placing the wastes in disposal sites. Subpart A also applies to spent fuel management, regardless of whether the fuel is considered to be waste or is destined for reprocessing.

Our studies tell us that the largest expected radiation exposures to the public from management and storage activities covered by these standards would be no more than a few millirem per year, which is somewhat lower than the requirements established in Part 190. We have, therefore, decided to extend the dose limits contained in Part 190 to all the commercial, NRC-licensed operations addressed in Subpart A.

To conform to other regulatory activities, however, management and storage operations associated with national defense activities have slightly different limits.

In Subpart B, we use a different approach because here we are devising environmental standards for the period after the repository is sealed. This involves very different considerations.

First, the requirements we established in Subpart B can only be implemented by the NRC and DOE in the design phase--by setting design principles or by analytically projecting disposal system performance. The more familiar concepts of implementation involving monitoring of emissions or ambient levels of pollutants are not applicable here because we cannot rely on such surveillance for the long time periods involved. Our rule, for instance, speaks of isolation for 10,000 years.

Second, the standards address unintentional releases, such as those resulting from human intrusion or geologic faulting. These Provisions must be applicable to a variety of disposal strategies because the Agency does not have the authority to specify details or to direct DOE or NRC concerning any one of a number of disposal methods or designs. Regulations by NRC or DOE, as appropriate, will control the specific designs.

For long-term containment requirements, we assumed that it is possible to predict some aspects of the future well enough to use these predictions for comparing and selecting disposal methods. Thus, we evaluated ways that waste might be released from a mined geologic repository, developed analytical models to predict potential releases and their distribution throughout the ecosystem over a 10,000-year period, and we estimated the possible risks that could result from these releases if they occurred in an environment similar to the one we know today.

In selecting the release limits for the standards, we had to project the performance of disposal systems which, of course, have not yet been demonstrated. There are, as you can plainly see, significant uncertainties inherent in such projections. To avoid underestimating these risks we often made pessimistic assumptions about how well a repository would work. For example, we assumed that human intrusion into a repository would take place as if no site markers or records discouraged it, beginning 100 years after disposal. Our estimates are, in fact, probably upper bound risk levels. When the Department of Energy selects and demonstrates actual control methods at a real repository site, we expect that releases will be well below the amounts allowed by our standards.

To select the specific release limits for the various radionuclides in a disposal system, we first estimated the number of fatal cancers that might be caused by releases from a variety of potential repository systems. Our assessments showed that many designs and sites could keep the risk level below 1000 extra cancer deaths over the first 10,000 years after disposal. This would be comparable to the number of health effects likely to occur if the uranium ore were still in the ground--in other words, not a significant risk to public health.

There is another reason why Subpart B differs so much from Subpart A. The standards in Subpart B must accommodate large uncertainties--uncertainties in our current knowledge about disposal techniques, and inherent uncertainties about the future. The future is, by definition, unknown. So protecting the public health and the environment, we think, involves encouraging use of disposal systems that are tolerant of potential mistakes in engineering design or site selection.

We faced these issues by developing assurance requirements which try to address and compensate for the uncertainties that necessarily accompany plans to isolate these dangerous wastes from the environment for such a long time period. No matter how promising analytical projections of a given disposal system's performance appear, high-level and transuranic wastes should be disposed in a cautious manner that reduces the likelihood of unanticipated releases.

In abbreviated form, the six qualitative assurance requirements in our HLW standard to protect against release of radioactivity to the environment are these:

(1) Disposal systems shall not depend on active insitutional controls for more than 100 years after disposal;

(2) Long-term disposal system performance should be monitored for a reasonable time as a supplement to other types of protection;

(3) Disposal systems shall be marked and their locations recorded in all appropriate government records to reduce the possibility of unintended disruption by future generations;

(4) Disposal systems shall be designed with several different types of barriers, both natural and engineered;

(5) Sites should not be located where scarce or easily accessible natural resources are located; and

(6) Wastes shall be recoverable for a reasonable time after they are disposed, if necessary, due to events unforeseen at the time of the disposal.

The containment and assurance requirements, we feel, are complementary: the containment requirements set limits on potential releases of radioactive material; the assurance requirements provide the framework necessary to develop the kind of confidence we need to meet the containment requirements, even in the face of uncertainties inherent in a process of such enormous duration. In the final standards the assurance requirements only apply to DOE controlled facilities. However, the NRC has committed to including provisions on these same matters in their own regulations, for NRC-licensed facilities.

You will note that the fourth assurance requirement would require the use of multiple barriers of varied types. The barriers which could fulfill this requirement must be a combination of both engineered and natural barriers. The reason for this? Even though an overall system analysis suggests that one may rely solely on the geologic media to contain the wastes, we are convinced that reliance on a "defense-in-depth" approach is vital due to the inherent uncertainties in our assumptions affecting the projection of disposal system performance over thousands of years.

In this regard, we fully support the Nuclear Regulatory Commission's approach of specifying minimum requirements for waste package lifetime and long-term release rates in 10 CFR Part 60, the rule that sets forth the technical criteria NRC will use to regulate geologic repositories. Our own performance assessments indicate that the Part 60 requirement for a waste form release rate no greater than one part in 100,000 per year, is quite important for reducing potential long-term risks--particularly in view of the uncertainties in hydrology and geochemistry that are associated with many of the sites under consideration. This release rate requirement should provide confidence in meeting EPA's disposal standards even if we have to make pessimistic assumptions about the performance of the natural barriers.

Somewhat less critical, but still useful, is the 10 CFR Part 60 requirement for a 300- to 1000-year waste package lifetime during which essentially no releases should occur. Our performance assessments generally indicate that package lifetimes in this range do not have a significant impact on projected societal risks over 10,000 years. Most of the simplified assessment models now in use, however, probably underestimate the contributions of waste canisters to long-term safety. Furthermore, waste canister integrity appears quite important in protecting against excessive exposures to individuals who might use groundwater in the vicinity of a repository. For these reasons, we agree with the NRC's judgment that such waste packages should certainly be part of a high-level waste disposal system.

Although 10 CFR Part 60 allows the Commission latitude to modify these engineered barrier requirements on a case-by-case basis, we advocate a very cautious approach in considering such exceptions. The intent of our assurance requirement on multiple barriers is to guard against the inherent uncertainties in predicting disposal system performance over thousands to tens of thousands of years. Accordingly, arguments that this or that engineered barrier is not needed for overall disposal system safety should be considered very skeptically. At the heart of most such arguments will lie the analytical predictions of systems models, and it is precisely the potential for these models to be wrong that is the basis of our assurance requirements.

Due to concerns raised by many States and individuals during the comment period, the final standards now provide for both groundwater and individual protection requirements.

Disposal systems for HLW shall be designed to provide a reasonable expectation that, for 1000 years after disposal, the radionuclide concentrations averaged over any year in water withdrawn from any portion of a special source of groundwater shall not exceed the Agency's Interim Drinking Water Standards which are: 5 picocuries per liter of radium-226 or radium-228; 15 picocuries per liter of alpha-emitting radionuclides; or the combined concentrations of radionuclides that emit either beta or gamma radiation that would produce an annual dose equivalent to the total body or any internal organ greater than 4 millirems per year, if an individual consumed 2 liters of drinking water per day from such a source of groundwater. (Special sources of groundwater are those designated by EPA as Class I groundwaters which serve large populations as a drinking water source.)

The standards also include individual protection requirements providing that the repository's undisturbed performance will not result in individuals receiving more than 25 millirems to the whole body or 75 millirems to any organ for 1000 years after disposal. In evaluating compliance with this provision all potential pathways from the disposal system to people shall be considered, including the assumption that individuals consume two liters per day of drinking water from any significant source of groundwater outside the controlled areas.

The implementation guidance contained in the HLW standards describes certain analytical approaches and assumptions through which EPA intends the various long-term numerical standards to be applied. This guidance is particularly important because there is no precedent for the implementation of such long-term environmental standards which require consideration of such extensive analytical projections of disposal system performance.

As I mentioned earlier, EPA does not have enforcement authority in this area. The standards for waste management operations--Subpart A--will be implemented by NRC, for commercial nuclear power activities, and by DOE, for national defense facilities.

The standards for disposal--Subpart B--will be implemented by NRC for all high-level wastes, whether the wastes come from commercial or military activities. The Nuclear Regulatory Commission will do this by developing its own regulations, such as 10 CFR Part 60, and by deciding whether and when to issue the necessary licenses.

Under current law, disposal of transuranic wastes from defense activities is not regulated by the NRC; therefore, DOE will carry out our requirements for disposal of this category of wastes.

After these standards were proposed December 29, 1982, public hearings were held in 1983 in Denver, Colorado and Washington, D.C. Numerous comments were received from private citizens, public interest groups, members of the scientific community, representatives of industry, and State and federal government agencies.

The issues related to the development of EPA's HLW regulation were very difficult in both their philosophical and technological aspects. Throughout this process, our working relationships with the Department of Energy and the Nuclear Regulatory Commission were extraordinarily good. The effort was characterized by professionalism on all sides and a cooperative spirit that seemed to say, "Let's get the job done."

This concludes my statement, Mister Chairman. If you have any questions, I would be pleased to answer them.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 13 1985

OFFICE OF
EXTERNAL AFFAIRS

DEC 19 1985

Honorable Robert T. Stafford
Chairman
Committee on Environment and Public Works
U.S. Senate
Washington, D.C. 20510

Dear Mr. Chairman:

Enclosed are our responses to questions contained in your November 21, 1985 letter to Mr. Sheldon Meyers, Director, Office of Radiation Programs, concerning his October 30, 1985 testimony on high-level radioactive waste disposal.

If I can be of further assistance, please let me know.

Sincerely,

Joy Manson

Jennifer Joy Manson
Assistant Administrator
for External Affairs

RESPONSE TO QUESTIONS FROM SENATOR STAFFORD

OCTOBER 30, 1985 HEARING ON HIGH-LEVEL RADIOACTIVE WASTE

Q1. As I understand it, the repository is not required to be designed so that there will be no releases of radioactivity into the environment around the repository; rather, the EPA standards and NRC regulations require that the releases be within certain limits. For example, EPA predicts that when all the reactor waste is disposed of in accordance with the proposed standards, it would cause no more than 1000 premature deaths from cancer for the next 10,000 years, which is about one premature death every ten years. If a repository were located near the Canadian border, would it be possible that some of these premature deaths would be among Canadians?

A1. To determine if any premature deaths caused by a high-level radioactive waste repository near the Canadian border would be among Canadians would require a detailed site-specific evaluation. The most probable mechanisms for repository releases to the accessible environment are through water transport. A site would have to be evaluated as to its hydrogeological characteristics and the possibility of contaminated water reaching Canadian citizens.

Q2. Would the siting of a repository near the Canadian border create a risk of increased radiological exposure to the Canadian environment?

A2. As noted in the response to Question 1, this also would be highly dependent on the specific site and its hydrogeology. No generic conclusion can be made.

Q3. Other countries may not consider our environmental standards to be appropriate for areas within their borders. Should the applicable environmental standards be more stringent for sites that are near international borders?

A3. We would think that this would be a matter requiring review of present U.S./Canadian agreements and possible further discussions. For instance, it is known that an International Joint Commission on the Great Lakes came to agreement several years ago on issues related to potential contamination of the Great Lakes.

Q4. Should we guarantee to countries on our border that we will not site a repository at a site near the border if there is any possibility that such a site could cause contamination or exposures across the border?

A4. This is a matter beyond the purview of EPA. We suggest that this question more appropriately be addressed to the Department of Energy and the Department of State.

Testimony of Leonard U. Wilson
Secretary, Agency of Environmental Conservation
State of Vermont
before
The United States Senate,
Committee on Environment and Public Works
October 30, 1985

Mr. Chairman and Members of the Committee:

I am Leonard U. Wilson, Secretary of the Agency of Environmental Conservation of the State of Vermont. I greatly appreciate this opportunity to expand on testimony that our Governor, Madeleine M. Kunin submitted to this committee at its hearing in Montpelier, Vermont on July 22, 1985. Among other issues, the Governor expressed her concerns on high level radioactive waste disposal.

Governor Kunin made five points in regard to the Crystalline Repository Project of the U.S. Department of Energy. As her testimony is in your record, and it includes a letter from the Governor to Secretary Herrington that enlarges on the Governor's primary concerns, I will only very briefly recapitulate here.

1. She challenged the scientific validity of the basic assumption underlying the project, that is, the conjecture that rock formations affording safe retention of nuclear waste actually exist.

2. She questioned the rationale for eliminating from repository site candidacy all rock formations except those found in sparsely settled rural areas despite the assurance of safe storage.

3. The Governor argued that transportation questions such as the hazards posed by hauling nuclear waste over icy mountain roads should be considered in the initial evaluation of potential sites.

4. She asked that thought be given to the impact on the residents and economies of the communities in the areas of the 15 to 20 rock formations which DOE is now selecting for prolonged further evaluation as potentially affording a repository site.

5. Governor Kunin proposed that Congress take another hard look at the repository search process. She requested reconsideration of the scientific validity of the project and a thorough review of DOE procedures.

Subsequent to that hearing, Governor Kunin has prepared an invitation to her fellow New England Governors to join her in a formal request that the Congress undertake an intensive and comprehensive evaluation of the scientific foundation of the Crystalline Repository Project and of its guidelines, procedures, methodology and criteria. Her resolution will be considered at a meeting of the New England Governors' Conference next week.

That draft resolution also proposes that the six-month period for consideration of the DOE Area Recommendation Report be extended to one year. That is the report which will narrow the field of candidate repository study areas from 236 to from 15 to 20. If the draft is released by mid-December as DOE is now predicting, it must be made final by mid-June 1986 under the present schedule. We believe that a full year is needed both for the evaluation of this report and the conduct of the congressional study we are requesting.

My fellow state environmental protection agency heads are meeting here in Washington today as the Environmental Subcommittee of the National Governors' Association. I am discussing Vermont's initiative with my colleagues in the expectation that a number of states share our apprehensions about this project and will also wish to support our proposal.

Beyond bringing this Committee up-to-date on this requested project evaluation, I would like to comment on the conduct of the Crystalline Rock Project and to expand on the root of our concerns in Vermont, the question of the scientific assumptions driving the project.

As to the conduct of the project from our Vermont perspective, I want to emphasize that we have had a very good working relationship with the project team. The Nuclear Waste Policy Act of 1982 provides for cooperation between state and federal governments to an unprecedented extent. With Vermont, DOE has implemented this coordination mandate conscientiously and effectively. We have plenty of disputes and disagreements, but it is an open and constant dialogue as you intended.

The members of the Crystalline Project team who have appeared publicly in Vermont deserve high praise for their comportment under very difficult circumstances. They agreed last Spring to participate in three informational hearings to describe their project and procedures. They remained admirably cool and objective under extremely emotional and sometimes personally abusive verbal assault.

Our problem lies not with the conduct of the Project team, but with the project's geotechnical foundations. As I mentioned a moment ago, Governor Kunin wrote Secretary Herrington of DOE on April 30 of this year to express her fundamental objections to the basic assumption that rock formations exist in the East that are appropriate for safe nuclear waste storage. Crystalline rock formations are typically brittle and fractured and contain groundwater often under artesian conditions.

Under EPA regulations, a site must have the capability of isolating radioactive material for 10,000 years. A site in a wet climate like the aqueous East must be virtually impermeable.

Does a rock formation exist in the Eastern United States in which a 2000 acre chamber could be excavated that would be impermeable?

That is the question that one would have thought would be extensively researched before this project was launched.

In her letter to Secretary Herrington, Governor Kunin concludes the discussion on the possibility of existence of an appropriate site by saying: "The probability of locating a rock formation ... has not been scientifically established to my knowledge. Therefore, the site search proceeds either on false assurances of intended safety or on indefensible prospects of successful conclusion."

The Department of Energy reply was signed by the director of the Office of Civilian Radioactive Waste Management, Ben Rusche, to whom Secretary Herrington referred the Governor's letter. This letter is included with the Governor's with my written testimony.

Rusche devotes one paragraph to this critical question. He says the obvious. A site will be judged unsuitable if found to have fracturing at repository depth that would result in its failure to meet performance requirements. He does not respond on the issue of the fundamental scientific credibility of the conjecture that a rock formation exists in which performance requirements can be met.

Our confidence in this project is low. We find no reassurance in the silence of the Department of Energy on the critical question we have raised. We remain persuaded that the repository search is based on a hypothesis, on untested speculation that a crystalline rock formation exists in which high level radioactive waste can be safely contained for 10,000 years.

The long-term stakes for humanity, to say nothing of the multimillion dollar costs of this project, argue for an intensive and comprehensive reevaluation of its premises and procedures. We urge that such a Congressional study be initiated.

STATE OF VERMONT
OFFICE OF THE GOVERNOR
PAVILION OFFICE BUILDING
MONTPELIER, VERMONT 05602
(802) 828-3333

April 30, 1985

John Herrington, Secretary
Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Secretary Herrington:

I am writing you to express my strong objection to your consideration of crystalline rock formations in Vermont for a high level radioactive waste disposal repository. I further oppose the continuation of your search because it evokes great anxiety and is based on criteria that are flawed in so far as standards are both untested and/or untestable and can not be proven except over time intervals never attempted in the history of the human race, and that population assessments are biased against rural areas.

To reemphasize my opposition to your continued search in Vermont I stress the following two conclusions: One, that your criteria includes a bias against rural areas, and two, that the Vermont crystalline formations are not geologically appropriate for the construction of a safe repository.

The rural bias is of particular concern to me, as the Governor of a rural state. If such a facility is safe anywhere, I seriously question why a greater risk is deemed acceptable in sparsely populated areas.

My expression of concern stems from a hearing on April 24 in Charlestown, Vermont when a Crystalline Repository Project Team provided a briefing on the process being undertaken by the Department of Energy to locate a suitable site for an underground high level radioactive waste disposal repository in the eastern United States. The team did its job in a professional manner under very trying circumstances and my distress does not arise from their attitude but rather with the issues their presentation raised.

I must seriously question the continuation of the search until certain factors are clarified. First among them is the possibility that a rock formation appropriate to safe nuclear waste storage actually exists. Crystalline rock formations are typically fractured and contain ground water in varying quantities under artesian conditions. The DOE geologist at the Charleston meeting acknowledged this fact. On the other hand, the team continually insisted that the 20,000 square foot chamber would be inspected inch-by-inch to insure that no fissures existed. The presence of cracks would render the site unusable. I am highly skeptical that such a potential chamber can be tested adequately and still preserve the natural state that is claimed to be the most important long term barrier to radionuclide transport. The drilling required to properly test a complexly fractured crystalline rock will compromise the required integrity of the site.

My understanding is that unless safety is guaranteed, the site will not be used. Safety is a function of the solidity of the chamber walls. The probability of locating a rock formation and creating a fractureless chamber has not been scientifically established to my knowledge. Therefore, the site search proceeds either on false assurances of intended safety or on indefensible prospects of successful conclusion.

The second issue of deep concern to me is the criteria that eliminates rock formations in all but sparcely settled areas. We are told that the disposal repository will be safe. It is disgracefully contradictory to argue that "inherent risk," the term used by your spokesman, dictates a rural site. I firmly believe that if the facility isn't foolproof it must not be built. If it is, it can be located anywhere.

I am emphatically opposed to the continuing search for a suitable site in Vermont because I do not believe such a site exists, and particularly in this state's fractured cyrstalline rocks. Moreover, I consider the low-density criteria indefensible and discriminatory against rural states. I believe that Vermonters and our neighboring Canadians have been unjustifiably frightened by this ill-conceived project.

Let me assure you that I am keenly aware of Vermont's responsibility to share its fair burden as we strive to find a solution for nuclear waste disposal. As a producer of nuclear waste at Vermont Yankee, we have an obligation to be part of the solution. However, we have an equal responsibility to speak out against a proposal which we believe to be unsound, both from a scientific and a "fairness" point of view.

I urge you to reassess your present policy and to establish revised criteria as you continue your search for an eastern location for a high level radioactive waste disposal repository.

I recognize that in challenging the validity of the premises on which the project goes forward I am challenging part of your congressional mandate. In light of the recent hearing and the information revealed, I find this fully justified.

Sincerely yours,

Madeleine M. Kunin
Governor

MMK/bjf

Department of Energy
Washington, D.C. 20585

GOVERNOR'S OFFICE
[illegible]

JUN 14 1985

Honorable Madeleine M. Kunin
Governor of Vermont
Montpelier, Vermont 05602

Dear Governor Kunin:

Your letter of April 30, 1985, to Secretary Herrington was referred to me for reply. Your letter expressed concerns regarding the suitability of Vermont crystalline rocks for a high-level radioactive waste repository and the use of population criteria for repository siting.

The Crystalline Repository Project (CRP), part of the Department of Energy's (DOE) second repository program, is currently in the regional phase of site screening. The DOE will screen over 200 crystalline rock bodies identified through consultation with the crystalline States in order to locate smaller areas where more detailed studies will be conducted. These rock bodies are located in 17 States throughout the North Central, Northeastern, and Southeastern regions. The screening process is described in the Region-to-Area Screening Methodology for the CRP which was released in final in April 1985. The DOE has actively solicited the cooperation of the crystalline States in the site selection process through review of CRP documents, input in the States weighting workshop, and participation in State and public meetings. It should be emphasized that the primary concern of DOE is safety. DOE believes that the recommended repository site will be safe and will meet applicable regulatory requirements.

As to your specific concerns, the presence of fractures in crystalline rock does not necessarily render a site unsuitable since most rock types are fractured to some extent. However, a site would be unsuitable if the nature and extent of fracturing at repository depth would compromise the integrity of the repository or would result in its failure to meet the performance requirements of the Siting Guidelines (10 CFR 960). When area phase field work commences, the data needed to make preliminary evaluations of the fracture characteristics and related groundwater flow conditions will be acquired. If, at that time, fracturing would result in unfavorable flow conditions for repository siting in a particular area, the area will be eliminated from consideration. Additionally, any induced conditions, such as the effects of shaft and tunnel excavation or thermal creep due to waste-generated heat, would be incorporated into the analysis.

Also, you expressed concern regarding the perception of an inconsistency between assurances of safety and the use of population density and proximity to highly populated areas as a criteria for site selection. It is the intent and primary objective of DOE to site a repository that will provide safe and permanent disposal of high-level nuclear waste. The statutory basis for this program lies in the Nuclear Waste Policy Act of 1982 (NWPA). The NWPA requires that DOE consider population factors in the siting of a repository in order to minimize any potential risk to the public from expected or accidental exposure to radiation due to releases from repository surface facilities. This was intended to avoid the selection of surface facilities located on or immediately adjacent to highly populated areas, primarily to protect the public during preclosure operations when nuclear wastes are being received and emplaced. The Siting Guidelines address this issue.

The CRP has applied many disqualifying, favorable, and potentially adverse conditions of the Siting Guidelines in order to ensure the selection of a licensable repository site. The screening methodology uses highly populated areas and one-square-mile areas having greater than 1000 people as demographic disqualifiers. However, distance from the above areas is only one of 20 screening variables used in the selection of candidate areas. The location of areas will depend, in part, on the relative importance of all 20 variables for a particular area, as determined in the States weighting workshop. Also, it should be noted that during its sensitivity analysis, DOE will consider a modified scale which would reduce the maximum distance to highly populated areas to determine the effect on the areas selected in region-to-area screening. The results will be documented in the Area Recommendation Report which will be issued in draft for State comment and review in November 1985.

Whether the crystalline formations of Vermont or any other State are environmentally or geologically appropriate for the construction of a safe repository can only be determined after detailed and intensive studies are performed on rock bodies selected for the area phase and for possible site characterization. The studies and the selection process will be subject to full State and public review.

I hope that this letter has addressed your concerns. Thank you for your interest in the Civilian Radioactive Waste Management program.

Sincerely,

Ben C Rusche

Ben C. Rusche, Director
Office of Civilian Radioactive
Waste Management

Testimony of

MELVIN R. SAMPSON
VICE CHAIRMAN, YAKIMA TRIBAL COUNCIL

BEFORE THE SENATE COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS

Oversight Hearing on Implementation of the Nuclear Waste Policy Act

October 30, 1985

Mr. Chairman, members of the Committee:

My name is Melvin R. Sampson. I am Vice Chairman of the Tribal Council of the Confederated Tribes and Bands of the Yakima Indian Nation. I am also Chairman of the Tribal Council's Committee on Nuclear and Hazardous Wastes. I appreciate this opportunity to present the views of the Yakima Nation on the implementation of the Nuclear Waste Policy Act of 1982.

The Yakima Indian Nation has been deeply concerned about and involved in the nation's program for disposal of high-level radioactive waste since the 1970's. We were active during deliberations on the Nuclear Waste Policy Act ("NWPA") during the 97th Congress, and were instrumental in the adoption of NWPA language pertaining to affected Indian tribes. Within two months of NWPA passage in early 1983, the Yakima Nation had submitted a petition to the Secretary of Interior for designation as an "affected Indian tribe" with respect to the Hanford Site near our Reservation. About a month later, we were so designated by the Interior Secretary. Since that time, the Yakima Nation has participated fully in all aspects of the federal nuclear waste program.

Two major milestones in implementation of the NWPA are DOE's issuance of its Mission Plan for the high-level waste program and its issuance of draft Environmental Assessments for the first repository candidate sites. There are many aspects of these documents which are of great concern to the Yakima Nation. My testimony will address four of them.

1) Preliminary Determination of Suitability

DOE states in the Mission Plan that it will make the preliminary determination of suitability required by section 114(f) of the Nuclear Waste Policy Act at the time that it recommends three sites to the President for characterization. This interpretation is thoroughly at odds with the agreement DOE had with NRC at the time the latter agency concurred in DOE's siting guidelines. The Yakima Nation feels strongly that the preliminary determination must come at or near the end of site characterization in order to have any substantive significance and to comply with the "natural meaning" of the statutory language and the National Environmental Policy Act.

Under DOE's present interpretation of that provision, the environmental impact statement which DOE submits with its application for construction authorization for a repository might consider as alternatives sites which are known at the time, as a result of characterization, to be unsuitable for development as repositories. We submit that such an EIS would be excellent grist for successful NEPA lawsuits. NRC Waste Management Staff and their attorneys, the Office of Technology Assessment, and the General Accounting Office in its recently issued annual report on this program, agree that DOE's proposed treatment of this issue poses very significant risks for satisfactory NEPA compliance. Unfortunately, however, a majority of the NRC Commissioners appear to be prepared to yield to DOE pressure not to press this issue.

In addition, delaying the preliminary determination of suitability until at or near the end of characterization, as the statutory language requires, would provide DOE with a much needed incentive to select for characterization the best possible sites. This would increase the likelihood that three will still appear to be suitable at the end of characterization.

2) Program Schedule

The Yakima Indian Nation supports the need for continuing progress toward safe disposal of high-level radioactive wastes. However, we are very concerned about DOE's apparent inclination--in spite of vigorous protests to the contrary--to elevate the schedule above all other considerations. This inclination is most tellingly manifested by the fact that, although virtually every deadline at the front end of the schedule has been missed--and with justification, we believe--DOE refuses to concede that the ultimate deadline of repository operation by 1998 might also need to be relaxed.

The only way the 1998 repository operation deadline can still be met is by cutting corners in future stages of the program, such as site characterization and the NRC licensing process. Quite apart from the obvious negative effects this schedule pressure would have on the technical quality of the program, the damage to the institutional aspects--that is, meaningful consultation and cooperation with states and affected Indian tribes--would be very threatening to the program. It is important to remember that previous failures in national nuclear waste disposal efforts have resulted as much from institutional inadequacies as from technical ones.

3) Defense Wastes

The Mission Plan treatment of the disposal of existing defense wastes is utterly deficient. It states that "readily retrievable" liquid wastes at Hanford will be solidified and disposed in a repository. It does not explain that DOE views the overwhelming majority of the existing defense waste at Hanford--constituting 60 percent by volume of the nation's total inventory of defense wastes--to be "not readily retrievable", and thus somehow not subject to the requirement of disposal in a repository. The Mission Plan does not explain DOE's legal authority to "dispose of" these wastes other than in a repository. Moreover, the Mission Plan does not discuss the implications for the repository size, loading schedule, and design and the transportation systems if this waste does have to be disposed of in a repository.

4) First Repository Site Selection

We feel strongly that the selection of appropriate sites for repositories is by far the most crucial aspect of this program. This is because the natural, geologic characteristics of the site are much more important than engineered features to the performance of a repository over tens of thousands of years. Congress recognized the importance of siting when it required that "detailed geologic considerations" should be the "primary criteria for the selection of sites in various geologic media."

Unfortunately, the Department of Energy's program is following neither the letter nor the spirit of this requirement. This failure is reflected both in the Mission Plan and in three key aspects of DOE's draft environmental assessments: First, the potentially acceptable sites were not selected on the basis of geologic considerations. Second, DOE reaches incorrect conclusions on many of the siting guidelines. And third, the draft EAs do not include a reasonable comparative evaluation of the sites as required by the NWPA.

Selection of Potentially Acceptable Sites

Before the NWPA was passed, DOE identified the nine potentially acceptable sites for the first repository, using several different sets of selection criteria. Two of the nine sites--Hanford and the Nevada Test Site--were initially selected on the basis of land use. That is, they were selected because they are on federal lands either dedicated to nuclear activities (Hanford) or adjacent to such activities (NTS).

DOE insists that Congress ratified the so-called potentially acceptable sites which had been identified by DOE prior to NWPA passage. Even if this contention is correct, it is apparent that Congress did not intend the requirements in section 112(a) and the siting guidelines to be disregarded in selecting sites for the first repository.

DOE concedes this to a point, and claims that its nine potentially acceptable sites pass a retroactive application of the guidelines. This claim is based on an analysis which concludes that they are not disqualified under any of the individual disqualifying conditions and that, instead, they are likely to be qualified.

However, DOE does not evaluate the nine potentially acceptable sites against the guidelines provisions for selecting potentially acceptable sites. Those nine sites can and should be evaluated against the guidelines provisions and the NWPA requirement that geologic considerations are of primary importance. At the very least, DOE should include in its EAs evaluations as to whether site screening based primarily on geologic considerations would have prevented or strongly discouraged the selection of any of those nine sites.

We believe that such an evaluation is absent from the EAs in large part because the Hanford Site would not survive it. Any reasonable, geologically-based site screening process would reject that site, with its highly fractured, saturated rock conditions, proximity to one of the country's most important rivers, and extraordinary geologic complexity, in favor of less complex and less saturated alternatives.

This view is not just the Yakima Indians saying "Not in My Back Yard". The view that the Hanford site would never have been selected on the basis of geologic suitability has been expressed in various forms by numerous respected scientific sources including the National Academy of Sciences, the U.S. Geologic Survey, and DOE's own Hydrology and Geology Overview Committee for the Hanford site. The Nuclear Regulatory Commission has gone to great lengths to avoid making such a conclusion explicit, apparently because of an unjustifiably cramped view of its authority to review DOE's site selection process. Nevertheless, the Commission has twice leveled technical criticisms at DOE's formal analyses for the Hanford site which make this same conclusion virtually inescapable.

Since the Hanford site could not have been selected as potentially acceptable on the basis of geologic considerations, as required by the NWPA, any reasonable site selection process should have eliminated it. The fact that DOE's process permitted the agency to "fudge" the Hanford site into the top three is sufficient indication of its failure.

Incorrect Conclusions Under the Guidelines

DOE has distorted the site selection process by "forcing" favorable conclusions to individual siting guidelines which are not supported by reasonable interpretations of the available evidence. Once again, this is not solely the view of the Yakima Nation; the NRC, the Department of Interior, the State of Washington, and the Umatilla and Nez Perce Tribes have also seriously questioned DOE's conclusions on several of the key guidelines.

We will mention just one major example of an apparently incorrect conclusion under the guidelines. For the crucial hydrologic characteristic of ground-water travel time (from the repository to the accessible environment), DOE has made several assumptions in its Hanford EA analysis which are contrary to accepted geologic practice. The result is that the travel times calculated by DOE are higher by a factor of 20 or more than should be the case. Correcting for these obvious errors yields a range of possible travel times which certainly requires that the site should be denied the favorable hydrologic condition for times greater than 10,000 years (10 CFR 960.4-2-1(b)(1)), and yields a very significant likelihood that the site should be disqualified for a travel time less than 1,000 years (10 CFR 960.4-2-1(d)). The NRC reached substantially the same conclusion on this matter as did the technical consultants of the Yakima Indian Nation.

By virtue of this and numerous other faults in DOE's Hanford geohydrology analysis, DOE has minimized the implications of the serious hydrologic problems of the Hanford site and distorted the comparative analysis of the sites in Chapter 7 of the EAs. DOE has informed us that it does not anticipate changing the conclusions for the geohydrology guidelines in the final EA, so this comment remains valid. There are similar problems with DOE's conclusions concerning geochemistry, rock characteristics, conflicts with atomic energy defense activities, effects on American Indian sacred sites, population density, meteorology, and site ownership and control, among others.

Invalid Comparative Analysis

Finally, DOE has failed to include a reasonable comparative evaluation of the sites that have been considered as required by NWPA section 112(b)(1)(E)(iv). Chapter 7 and Appendix B of the EAs, through which DOE purports to fulfill this requirement, do not suffice for several reasons. First, the comparative evaluation fails to include all nine of the sites that have been considered, as required by the statute. Rather, it only compares the five sites which DOE proposes to nominate for characterization.

Second, DOE's failure to compare the sites on the basis of system guidelines in the EAs--particularly the key postclosure system guideline--violates the requirements of the guidelines, frustrates the statutory requirement for the primacy of geologic considerations in site selection, and hides the profoundly inferior expected isolation performance of the Hanford site relative to the other candidates. The siting guidelines clearly require that the EAs include comparisons among sites on the basis of each guideline, including the system guidelines. 10 CFR §§ 960.3-2-2-2 and 960.3-2-2-3. Furthermore, 10 CFR § 960.3-1-5 provides:

> Comparisons between and among sites shall be based on the system guidelines, to the extent practicable and in accordance with the levels of relative significance specified above for the postclosure and the preclosure guidelines. Such comparisons are intended to allow comparative evaluations of sites in terms of the capabilities of the natural barriers for waste isolation and to identify innate deficiencies that could jeopardize compliance with such requirements. If the evidence for the sites is not adequate to substantiate such comparisons, then the comparisons shall be based on the groups of technical guidelines under the postclosure and preclosure guidelines.... Comparative site evaluations shall place primary importance on the natural barriers of the site.

(Emphasis added.)

The postclosure system guideline, (10 CFR 960.4-1) which requires that "[t]he geologic setting at the site shall allow for the physical separation of radioactive waste from the accessible environment after closure in accordance with the [EPA standards and the NRC technical criteria], is the embodiment of primacy of geologic considerations in selecting sites. The expected isolation performance of the respective sites, which determines compliance with this guideline, is the single most important factor in determining the suitability or sites. Thus, expected isolation performance should be the most important factor in selecting sites for characterization.

Yet DOE fails to compare the sites on this basis in the Draft EAs, relying on the escape clause of the next to last sentence quoted above, regarding the inadequacy to substantiate comparisons, to justify its failure. DOE claims that "[t]he different approaches to the evaluation of waste-package performance, the conservative nature of these assessments, and the uncertainties in the parameters on which the analyses are based all limit the ability to rank the sites in terms of these results." (Hanford Draft EA at p. 7-55, referring to the preliminary performance assessments required under the post-closure system guideline.)

This excuse does not wash. DOE cannot argue that the evidence is not adequate to substantiate comparison under the postclosure system guideline, since it has in fact completed preliminary performance assessments for each of the sites. If the uncertainties in the parameters on which the analyses are based do not invalidate the individual preliminary performance assessments themselves, there is no reason why they should prevent comparisons. If anything, the inherent uncertainties are less important for a comparative analysis than in the absolute analyses. Even DOE acknowledges in another part of the EAs that "relative analysis reduces the effect of uncertainties." Thus, if preliminary performance assessments are practicable at this time, comparisons under those performance assessments are also practicable, and thus required by the siting guidelines.

DOE has apparently declined to compare the sites on the basis of the postclosure system guideline specifically to avoid the bad light such a comparison would cast on its selection of the Hanford site as one of the top three. Because DOE failed to include such a comparison in its EAs, the Yakima Indian Nation included a limited preliminary model comparison of a basalt site to a bedded salt site in the technical appendices which accompanied our comments to DOE. The results of that comparison show that a basalt site would result in several orders of magnitude more health effects than a bedded salt site over a 100,000 year period. While the uncertainties inherent in such a preliminary performance analysis are great, comparative differences of the magnitude shown here can be credited with significant validity, and strongly indicate the fallacy of DOE's conclusion that Hanford is one of the three best sites.

Finally, Chapter 7 and Appendix B of the EAs fails to constitute a reasonable comparative evaluation of the sites because the methodology DOE uses to aggregate the rankings for the individual guidelines is invalid. DOE purports to aggregate the sites by three different methods, which it calls "averaging", "pair-wise comparison", and "utility estimation". The first two methods are totally invalid, as they do not account for the relative differences among the sites for each guideline. That is, very small differences are treated exactly the same as very large differences.

The "utility estimation" method has the potential to constitute a valid means of comparison, as it provides a mechanism to reflect the relative differences through subjective assignment of scores and weights to each site for each guideline. Unfortunately, the scores and weights which DOE has assigned appear to be distorted by several aspects of DOE's analysis. First, DOE's faulty guidelines conclusions as discussed above result in incorrect scores. For example, if DOE had reached more defensible conclusions on hydrology conditions, the Hanford site should have been given a score of 1 or 2 for that guideline, instead of the 6 which DOE assigned (assuming it would not be disqualified outright).

Second, by assigning equal weight to all guidelines in a set instead of reflecting the relative significance of each guideline for each site, DOE has severely distorted the relative worth of the sites. For example, at the basalt and tuff sites, dissolution is not a factor at all, yet DOE has given the same weight to that factor as to hydrology, which at the Hanford site should be by far the predominant consideration. This fact alone renders the comparisons meaningless.

Third, by assigning a much larger range of scores to the preclosure guidelines (EA Table B-3) than to the postclosure guidelines (EA Table B-2), DOE has caused the former to dominate the comparisons in violation of the statutorily required primacy of geologic considerations. Since DOE does not present the method by which the scores were assigned, the process is totally unreviewable. For this reason, we cannot identify where the mistakes originate in the process. Nevertheless, the fact that population density has a range of 7 points from the lowest to the highest, and transportation has a range of six points, yet postclosure hydrology only has a range of 3 points, strongly suggests that there are serious problems with the scales used in DOE's so-called comparative evaluation. This fact was emphasized by NRC in its comments on the EAs.

Conclusion

Experience to date has shown that the deadlines set in the Nuclear Waste Policy Act are unrealistic. DOE stubbornly insists that it can still meet the 1998 deadline for repository operation in spite of its demonstrated inability to meet any of the program's early deadlines. This is causing the agency to make decisions and take actions now which will undoubtedly result in avoidable litigation and lengthy delays--far greater delays, we believe, than would result from a more deliberate, consultation and cooperation oriented approach. DOE has stated in numerous forums that if Congress disagrees with the approach taken in the Mission Plan, it will say so. We are aware of the general congressional reluctance to reopen this legislation. However, DOE is engaged in a course which seriously threatens to result in yet another major failure in the field of radioactive waste disposal. Congress should take the agency up on its invitation to straighten the situation out.

STATEMENT OF PATRICK D. SPURGIN

ON BEHALF OF THE STATE OF UTAH BEFORE

THE SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS SUBCOMMITTEE ON NUCLEAR REGULATION

October 30, 1985

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

Thank you for this opportunity to provide this statement on behalf of the State of Utah concerning the Department of Energy's Mission Plan. Section 301 of the Nuclear Waste Policy Act of 1982 requires the Secretary of Energy to prepare a comprehensive report which shall provide an informational basis sufficient to enable informed decisions to be made in carrying out the Department's nuclear waste management program. The Act requires that the Mission Plan contain certain elements which includes, among others,

a) an identification of primary scientific engineering and technical information necessary for siting and construction of a repository;

b) an identification of necessary information which is not available due to unresolved technical questions, and a plan for resolving such issues; and

c) an evaluation of the legal, financial, political and institutional impediments to the implementation of the Nuclear Waste Policy Act and recommendations for legislation to remove such impediments as appropriate.

The Act also requires that the Mission Plan be submitted to various federal agencies, the states, and ultimately, to Congress.

We believe that the Mission Plan is intended to serve several purposes. One of those purposes is to oblige DOE to consider its responsibilities under the Nuclear Waste Policy Act and to plan carefully for their implementation. Another purpose is to enable the Congress, the states, and the general public to evaluate the adequacy of DOE's implementation of its responsibilities under the Act.

Through the Nuclear Waste Policy Act, Congress has given the Department of Energy a technically complex and politically difficult job. The issuance of the final Mission Plan in June of 1985 is the culmination of many months of effort by many people. The magnitude of the job to be done, and the effort expended must naturally inspire a sense of accomplishment among the drafters. However, we must ask whether the Mission Plan fulfills the purposes contemplated by the Act, and we must conclude that it does not.

The Mission Plan must reflect the Department of Energy's consideration of its responsibilities under the Act and careful planning for implementation of those responsibilities. In accordance with the language of Section 301 (a) and Section 301 (a)(1), the Mission Plan must provide a sufficient informational basis to permit informed technical decisions with respect to siting a repository. In Section 116 of the Act, DOE is required to identify potentially acceptable sites as defined in that section. Section 112 requires the Secretary to nominate five sites from among the identified potential acceptable sites and then, from among the five nominated sites, to recommend three for site characterization. The nomination and recommendation of sites for characterization is to be based on guidelines which are also prepared pursuant to Section 112 of the Act.

According to the law, the guidelines must employ both geologic and non-geologic criteria. These criteria must be applied to scientific, engineering and technical information related to the sites. The Mission Plan does not identify primary scientific and technical information related to the designation of a potentially acceptable site, nor does it articulate the costs and benefits that are balanced in the designation of potential acceptability. Neither does the Mission Plan identify such primary information necessary for the nomination of a site or recommendation of a site for site characterization. We believe that this is a fundamental inadequacy of the

Mission Plan, in particular, and the Department of Energy's program, in general. The potential result of this approach is that unsuitable or least-suitable sites will be characterized or potentially even recommended for a repository.

In the case of Utah's Davis Canyon, a geologic fault which might serve as a pathway for water, and thus a pathway to the environment for radionuclides, has been inferred from proprietary information obtained by DOE subsequently to the identification of Davis Canyon as a potentially acceptable site. The identification of the Davis Canyon site was based on a pre-Act screening criterion which ruled out areas within two kilometers of such a fault. It appears, therefore, that, had DOE had known of the fault before the identification of the Davis Canyon site as a potentially acceptable site, the two kilometer screening criterion would have ruled out the site in whole or in part.

Similarly, a geologic structure known as the Indian Creek Syncline lies to the northeast of the Davis Canyon site. Private sector exploratory work at a similar structure (the Cane Creek Anticline) strongly suggests that certain hydrologic assumptions related to flow gradients, fractures, and other characteristics which were used in the evaluation of the suitability of Davis Canyon are simply wrong because of the presence of the syncline. Both geologic concerns arise from the uncertainties associated with geoscience generally. This information belies the deferral of virtually all significant geologic testing until site characterization, and indicates the great importance careful analysis of pre-nomination data requirements by the Department of Energy in the Mission Plan. Perhaps more importantly, this information suggests that the pre-Act screening program was technically inadequate, and if the initial screening criteria were valid, that continued consideration of the Davis Canyon site was misguided.

The uncertainties associated with geoscience are also a basis for concern with the site characterization planning process that has been undertaken and is referred to in the Mission Plan. The DOE commitment to overall schedules presents the risk of a necessity to compress subordinate testing schedules to meet the overall deadlines. For example, the fundamental reason for sinking an exploratory shaft is to enable _in situ_ testing of the host rock to identify the ranges of parameters at the repository horizon which are directly relevant to public health and safety and the capability of a site to isolate radionuclides. This is particularly important in salt host rock because of significant unknowns related to salt creep rates, retrievability and shaft sealing technologies. A more detailed discussion of these concepts and their relevance is appended to this statement on Appendix A. If the planned testing schedule is excessively compressed, such a schedule may preclude collection of adequate information related to these phenomena. However, discussions with the Department of Energy suggest that, in fact, the _in situ_ testing schedule is indeed becoming inexorably compressed. To date, the Department of Energy has failed to demonstrate that the compressed schedule would, nonetheless, provide sufficient information to enable adequate characterization of the salt sites and protection of the public health and safety. Furthermore, the Department's performance to date provides little basis for confidence that the schedule contained in the Mission Plan will be met. The implementation of the Act is characterized by continual schedule slippage. In any event, schedule-based decisions to forego necessary data collection at early stages of the siting process are a sure way to increase the likelihood that the nuclear waste program will collapse.

We have only touched on certain key concerns of the State of Utah with regard to the Mission Plan. To summarize, while there will necessarily be uncertainties concerning technical issues in the repository program due to inherent uncertainties in geoscience, informed decisions must, nonetheless, be made at various stages of the siting program. The Mission Plan must provide for such decisions and, at present, does not.

The Mission Plan must enable the Congress, the states, and other parties to evaluate, at least in general terms, the sufficiency of the Department of Energy's implementation of its responsibilities. The sheer volume of technical data associated with the Nuclear Waste Program necessarily limits geotechnical information which can be reasonably contained in the Mission Plan. In one key area, however, Utah believes that the Department of Energy could have said more. This key area is the subject matter of Part II, Chapter 3 of the Mission Plan concerning financial, political, legal and institutional impediments to program implementation. We feel that the discussion of consultation and cooperation agreement negotiations is incomplete, that DOE fails to discuss a potentially significant conflict between the mandates of DOE and other federal agencies, that DOE's discussion of litigation is disingenuous, and that significant disputes related to program funds are not addressed.

In Chapter 3, the Department of Energy identifies potential issues with regard to the negotiation of consultation and cooperation agreements. The chapter notes that negotiations have been undertaken with the State of Washington and other parties. DOE fails to note that negotiations have broken down over concerns about state liability for accidents arising from program operations and related concerns with pending and proposed legislation for the reauthorization of the Price-Anderson Act. Liability and compensation issues related to nuclear waste will likely continue to be a sticking point in consultation and cooperation agreement negotiations unless the ambiguities in the current system of compensation under the Price-Anderson Act are clarified. Consequently, the statement that legislation is not necessary, at present, is less than circumspect since, at least in the case of State liability issues, legislative action might improve the likelihood of the successful negotiation of a consultation and cooperation agreement.

The Department of Energy also acknowledges the difficulties in acquiring access to or control of lands as a potential impediment to implementation to the Act. A related matter, which DOE fails to discuss, is the potential conflicting land use mandate by federal agencies which control land to which access may be required for site characterization purposes. There is a significant likelihood that effective site characterization at Davis or Lavender Canyons in Utah would require drilling within the boundaries of Canyonlands National Park. The National Park Service has already stated that drilling in the Park would be in conflict with both Park management plans and with the enabling legislation which established the Park. This problem is also related to general Department of Energy planning. Disputes between the Department of Energy and other federal agencies concerning access to Park lands for drilling purposes must be recognized as a significant impediment to the progress of the program, should it become focused on Davis or Lavender Canyon.

In Chapter 3, the Department of Energy also notes that litigation by states and other parties may delay the program, and that litigation is made likely by the 180-day period for petitioning for judicial review contained in Section 119 of the Act. In fact, numerous suits have already been filed by various parties concerning site selection decisions, grant guidelines, and the Section 112 (a) site selection guidelines. These suits are based on conflicts which have not been resolved through consultation and cooperation, and likely could not be resolved through that means due to their basis in different interpretations between the parties of fundamental provisions of the Nuclear Waste Policy Act. The Department of Energy must anticipate other such suits on the basis of conflicts that have already been identified through informal communications between the agency and other parties. Failure to acknowledge such conflicts and the statutory ambiguities giving rise to them is inconsistent with the purpose of the Mission Plan. Such information is, itself, fundamental to Congressional decisions to revisit the Act to rectify ambiguities.

A final impediment to the successful implementation of the Act is the failure to internalize certain program costs. These costs include those associated with state reliance on judicial review provisions of the Act and with the role of sites which are nominated for characterization but not characterized. The State's role in the Act is founded upon the importance of public confidence in the Act's implementation. Where the citizens of a state fear that misinterpretation of the requirements of the Act will exact an unrecoverable cost in terms of health, safety, and the environment, the State must strive to assure that the misinterpretation is corrected. The Congress anticipated the consequential resort to judicial review in passing Section 119 of the Act. The cost to the state of pursuing statutory judicial review in furthering public confidence is as much a program cost as the sinking of an exploratory shaft. In managing the nuclear waste fund, however, the Department has chosen to externalize this cost. The Department must apprise the Congress of this cost, and the Congress must consider the fundamental unfairness of imposing the burden of this program cost on state taxpayers.

An additional cost is exacted in those states and localities which contain sites which are nominated but not recommended for site characterization. Presently, the Department intends to hold such sites in "alternate" status. The affected states or localities are left with great uncertainties concerning the allocation of human and physical resources. From these uncertainties will arise conflict. Again, the Department must apprise the Congress of the nature of and potential for such conflict to enable congressional evaluation of the Department's efforts resolve potential disputes arising from these circumstances.

In conclusion, The State of Utah believes that the Mission Plan does not reflect adequate planning and a clear understanding of the Department of Energy's responsibilities under the Nuclear Waste Policy Act. The nuclear waste management program is proceeding on the basis of inadequate information as a result. Furthermore, the plan provides insufficient insight into the nature of the impediments which may arise during the course of program implementation, and does not give Congress information necessary to evaluate the effectiveness of the Department of Energy's implementation of its responsibilities under the Nuclear Waste Policy Act.

APPENDIX A

Potential Problems With an Abbreviated In Situ Testing Program For Salt

prepared by

Jack Wittman, Associate Director

The DOE Salt Repository Project Office (SRPO) indicates that the in situ testing program would absorb the "lost time" from other program delays.

At a June 18, 1985 DOE/NRC management meeting in Columbus, Ohio, a brief description of critical path activities included two figures showing the timing of various SRP activities. The two figures were labeled BASELINE and CHANGES TO BASELINE. The only difference between the two diagrams was in the dates that certain activities were scheduled to occur; the baseline condition assumed that the final environmental assessments would be finished by June of '85, while the revised diagram integrated already known slips in the timing of the release of the final EAs. The revised diagram assumed that the final EAs would be published by August, 1985, an effective two month slip in the baseline case.

In the revised schedule diagrams (and in the Mission Plan), the DOE has determined that slips in early milestones would not affect the "absolute" deadline of accepting wastes by 1998. This assumption has correspondingly lessened the amount of time spent in certain other activities (i.e. schedule compression). Currently all compression would take place in the in situ testing program, shortening the program duration from 11 to 9 months. Given the fact that the final EA's are now scheduled for release in December of 1985, there is reason to believe that target dates will be further revised by four months, An assumption that was substantiated at the SRP management meeting in June. The Salt Office Program Manager stated that if the EAs were not finalized until December of 1985, the in situ testing program would be further truncated to five months. Both the NRC and the States have expressed concern that this may not provide sufficient time to gather adequate thermal-mechanical data stress for the prediction of long-term repository performance parameters.

Some of the most important public health and safety aspects of repository operation are directly related to the reliability of the results of the in situ testing. The Basalt Waste Isolation Project has recognized this relationship; consequently, BWIP's prime contractor, Rockwell International, has been operating a Near Surface Testing Facility at the Hanford Reservation for over five years, gathering data on the thermal/mechanical stress properties of basalt. In situ testing takes on an even greater significance in a salt rock body, in which salt creep rates, retrievability, and shaft sealing technologies can present particular problems in the prediction of long term performance. These technical problems are discussed in greater depth below.

Salt Creep Rate: One of the more important design criteria in a salt repository is the amount of movement that can be expected in the host rock under the thermal and mechanical stresses of the emplaced waste. Tests of the stress-strain behavior of rock salt have been carried out on salt from Avery Island, the Waste Isolation Pilot Project in New Mexico, and borehole core samples from each of the different geohydrologic basins being considered for the first deep geologic repository. Each of these tests has had different objectives, but none of the tests are conclusive with regard to the prediction of long term creep rates.

The Avery Island tests included transient creep and steady state creep experiments with duration of up to seven months. The objective of these tests was to develop empirical models for predicting long-term creep rates under various thermal and mechanical conditions. Even though there are only two identified mechanisms of deformation in pure NaCl rock, small impurities that occur in every potential host rock can change the way the rock behaves:

> "...the micromechanical effects of pre-existing subgrain structure, free dislocations, fluid inclusions, and impurity ions on the rheology of rock salt are still barely understood, as are the effects of changes of these material properties during deformation on structure dependancy for constitutive laws." (ONWI-550, 1984, p.124)

Without in situ tests, therefore, there is no way to make the estimates necessary to predict the response of the rock mass hosting a waste repository during its construction, operation, and post-operational phase (a period of up to 125 years). Without these estimates it will be difficult to adequately assess the performance of the repository or to allocate the performance among the various components of the containment systems. (These are certainly going to be licensing concerns that will have to be worked out between the NRC and DOE.)

The tests have been performed on salt from each of the four salt geohydrologic basins (Vacherie Dome, Richton Dome, the Palo Duro Basin, and the Paradox Basin) to obtain some comparable geomechanical data (ONWI-450, 1983). The results of these tests have illustrated the effect of the above mentioned site specific variables on rock strength and flow characteristics. The authors of this ONWI document also warn against using these data, or the empirical models that were derived from them, to compare the behavior of the different salt bodies beyond the time frames of the tests (six months).

The body of data on and the status of knowledge of salt creep may be best illustrated by the operation of the WIPP facility in New Mexico, where the Department of Energy and its contractors have had to apply the theory of salt creep to an actual repository. The facility was, in fact, designed with preliminary geomechanical data. Although the data and the models were the most advanced in the field, the predicted salt creep has been less than that observed by as much as a factor of four. It appears that the models used to predict short term creep are not only inaccurate; they are not conservative.

Conclusions:

It would appear that the DOE is consciously generating incomparable data bases for the different rock bodies.

At the Hanford Reference Repository Location, three years of data were gathered on the behavior of basalt under thermal and mechanical stresses at the Near Surface Testing Facility. The heater tests *have been completed*, and the DOE contractors are now beginning an entirely different characterization-phase study. Because of the problem of the lack of transferability of laboratory (or near surface) data to the conditions at depth, the DOE and Rockwell International have every intention of completing a subsurface testing facility to gather the same type of information.

The SRPO has no testing program underway to gather data in situ on a salt host rock.

All of the work so far referenced by the DOE Civilian Waste Branch has comprised laboratory studies of different rock salt. It may become necessary for the DOE to attempt to use data collected at WIPP in order to satisfy the requirements of a reasonable comparison of sites *after site characterization*. The WIPP heater tests are only now getting underway, and it is questionable whether the temperature-range being used in experiments is representative of the hotter wastes that will be put in the commercial repository. As discussed previously, the variables of interest in an *in situ* testing program are sensitive to small scale variation in salt properties; hence, data from WIPP would not be transferable to other salt sites.

The DOE appears to be willing to sacrifice the integrity of one of the primary data bases that is to be produced as a result of site characterization without any justification beyond meeting the program schedule.

The small scale, short duration laboratory stress tests that have been performed to date are very basic data collection efforts which in no way substitute for the repository scale, long duration *in situ* testing required before many important design parameters can be used with confidence (NUREG/CR-3489, 1984).

STATEMENT OF WARREN BISHOP, CHAIR
STATE OF WASHINGTON NUCLEAR WASTE BOARD
to the
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
October 30, 1985

Chairman Stafford and members of the Committee.

Thank you, Mr. Chairman, for inviting me to present our views. My name is Warren Bishop. I am Chair of the state of Washington Nuclear Waste Board, which is the policy group responsible for high-level radioactive waste disposal issues.

My testimony will focus on major state of Washington concerns about U.S. Department of Energy (USDOE) implementation of the Nuclear Waste Policy Act. I will discuss ranking methods, implementation of the ranking methods, the preliminary determination of suitability, defense wastes, and other Mission Plan issues.

Ranking Methods - Implementation. On August 1, Governor Gardner stated in testimony before the House Subcommittee on Energy Conservation and Power of the House Committee on Energy and Commerce that the effort to site a high-level repository is on the wrong track. Public confidence is already at a low point. He recommended a pause in the headlong rush to site a repository and proposed that an independent panel of non-USDOE experts be asked to examine the adequacy of EA data, conduct a new evaluation of sites and make a new comparative analysis of sites. He asked USDOE to set aside political considerations and focus on a single issue--the issue of safety.

USDOE recently agreed to a portion of Governor Gardner's recommendation. The National Academy of Sciences (NAS) was requested to review the proposed ranking methodology to be used in the final Environmental Assessment (EA). Although the scope of the USDOE request was very limited, the fact that the Academy was asked to review any part of the USDOE program is a step in the right direction.

The National Academy of Sciences Board on Radioactive Waste Management responded to USDOE's request on October 11th. Although the National Academy Board concluded that the concerns which it had earlier expressed regarding the methods used for ranking sites described in the draft Environmental Assessment had been addressed, it emphasized that an opportunity was not provided to the Academy to examine the specific implementation of the proposed technique, including weighting factors, criteria for scoring, and procedures for selecting panels of technical experts and USDOE decision makers. The Academy Board was strong in its view that the ranking methods must be implemented correctly and accurately to be useful and credible. USDOE has proposed that its technical experts and those of its contractors use their ranking method to develop performance measure scales and to score each site on those scales. The Washington Nuclear Waste Board is concerned that USDOE's use of its own technical experts to assess performance by this subjective method may mask the degree of real uncertainty associated with post-closure issues. The Academy, the Nuclear Waste Board, and Governor Gardner agree that credibility of post-closure performance analyses would be substantially enhanced if the analyses were conducted by an independent panel of outside experts. They also agree that it is crucial that USDOE take time to do the job right.

Governor Gardner and the Nuclear Waste Board view the Academy method review as a key event requiring consultation with the state of Washington. We are now preparing our comments to be taken into consideration while the final Environmental Assessment is being prepared. We will continue to insist on an extension in the USDOE schedule so non-USDOE experts can examine the adequacy of data, conduct a new evaluation as to whether sites under consideration are suitable for site characterization, and make a new comparative evaluation of the sites still under consideration. We again emphasize that the credibility and quality of USDOE's work will be enhanced by getting this program on the right track.

Preliminary Determination of Suitability. On September 6, Governor Gardner presented his views to the Nuclear Regulatory Commission on the importance and timing of the preliminary determination of suitability of potential high-level waste repositories. He clearly and forcefully testified that the Act requires that a preliminary determination of suitability be made after characterization is substantially complete. The U.S. Nuclear Regulatory Commission (USNRC) concurrence with the USDOE siting guidelines included a provision that the determination be made after characterization. In the final Mission Plan, USDOE stated that the determination will be made before characterization. We strongly disagree with the USDOE reversal. Because this is a critical issue for the state of Washington, the state of Washington Nuclear Waste Board passed Resolution 85-3, which strongly recommends that USDOE substantially complete site characterization before making the preliminary determination. A copy of the resolution is attached to my testimony.

In our view, a premature determination will allow USDOE to give a grade before the test is taken. This approach will surely lead to legal challenges, which will certainly delay the repository program. A premature determination runs counter to the NWPA's intent of siting a safe repository with a supportable procedure. A determination after characterization will protect public health and safety, ensure public confidence, and comply with the Nuclear Waste Policy Act.

Defense Wastes. Defense wastes continue to be a major state of Washington issue. The Hanford Nuclear Reservation has played a key role in this nation's defense effort, but we, in the state of Washington, are now faced with a massive legacy of temporarily stored nuclear wastes. As you know, the Reservation was established under the War Powers Act during World War II. Nuclear wastes from defense activities have been building for over forty years. Hanford now has the world's largest accumulation of nuclear wastes. Nearly 60 percent by volume of this nation's high-level nuclear wastes is at Hanford. About half the long-lived transuranic wastes and about 75 percent of defense low-level wastes are buried there. Hanford also presently receives over half the nation's commercial low-level waste.

President Reagan has decided that it is appropriate to commingle defense and commercial high-level wastes in one repository. We agree with this decision. However, we strongly disagree with USDOE's plan to process only a portion of Hanford's high-level nuclear wastes. The Mission Plan ignored the fate of high-level wastes stored in 149 older, leaky, single-shell tanks. These high-level wastes are made up of soluble salts, sludge, and residual liquids.

The final Mission Plan gives insufficient information to permit informed defense waste decisions. More information is needed on waste quantities, acceptance rates, characteristics of the wastes, and the effect of defense wastes on repository design, capacity and operation. We are not convinced that leaving large amounts of high-level defense waste in the ground at Hanford is the safest thing to do.

Liability. Congress must, with dispatch, address the problems of liability and compensation for damages and injury arising from the disposal of high-level waste under the Nuclear Waste Policy Act (NWPA). It is Governor Gardner and the Nuclear Waste Board's position that Congress should be guided by the following "cornerstones" for all high-level nuclear waste incidents.

1. Strict and absolute federal liability, without regard to fault, should be the fundamental federal policy.

2. Full compensation should be provided, regardless of fault, to all victims of any nuclear incident arising from high-level nuclear waste incidents.

3. A red-tape-free program should be established that provides for victims to be compensated for all losses expeditiously and without any undue burdens.

4. States and other entities should be "held harmless" from any liabilities that they might otherwise incur through any incidental role they may have in their response.

In our view, many of the NWPA's programs will never be achieved unless Governor Gardner's four "cornerstones" are enacted into federal law. Washington and several other states are currently working together to develop proposed legislation for consideration by Congress. We will certainly share the product of our cooperative effort with this Committee.

Monitored Retrievable Storage. The final Mission Plan presents a more detailed description of a Monitored Retrievable Storage (MRS) facility which is an "integral" part of the federal high-level management system. From USDOE's viewpoint the advantage of MRS is that it will allow the acceptance of waste by 1998. We are concerned that an integrated MRS seems to go beyond the scope of the Nuclear Waste Policy Act. We must see how an "integrated MRS" affects the operation of a possible repository at Hanford. Congress should address these issues during MRS authorization hearings. A clear resolution is essential for prompt implementation of the Nuclear Waste Policy Act.

Transportation. Transportation of nuclear wastes is an immediate, major concern to our citizens. The Mission Plan now reflects a higher level of sensitivity to transportation-related issues than was evident in the draft version. However, a majority of the significant issues have been deferred for later treatment. We are disappointed that route-specific risk analysis will be limited to impact analysis for the EIS.

Schedules. There is a continuing lack of realism in the repository development schedule. The June, 1985 Mission Plan schedule shows a slippage of 11 months since the draft schedule was issued, yet USDOE has not adjusted the dates for receipt of a construction authorization or for waste acceptance. This over-optimistic schedule could result in a less than thorough site selection and characterization process and less opportunity for meaningful consultation with states.

We have not criticized USDOE for missing its schedule for issuing a Final Environmental Assessment because we have been assured that the quantity and quality of comments will improve the final product. On the other hand, we have criticized USDOE when it attempts to meet unrealistic schedules which jeopardize public confidence in the repository program.

We are concerned that the USDOE emphasis on schedule will be at the expense of technical excellence during site characterization. The Hanford site, if chosen for characterization, will provide unique technical challenges to USDOE. The site contains fractured, highly stressed basalt saturated with hot water. Hanford has the most complex geologic medium under consideration. In addition, the site is located just a few miles from the vital Columbia River.

Governor Gardner has been very concerned about USDOE implementation of the Nuclear Waste Policy Act and about the suitability of the Hanford site. As a result, he has established three conditions which must be met before Washington State would consider accepting a repository. These conditions are:

1. USDOE must demonstrate to our satisfaction that the repository will be safe.
2. USDOE must demonstrate that Hanford is better and safer than any other site.
3. The proposed repository must be acceptable to Washington State citizens.

His three conditions are common sense requirements for a successful repository program. Governor Gardner, the Nuclear Waste Board, and I believe the Nuclear Waste Policy Act, as written, gives USDOE the framework to attain our common goal of safe, permanent disposal of high-level wastes. However, we do request that you make sure USDOE obeys the Act, especially in the areas of defense waste and preliminary determination of suitability. Please do not allow USDOE to short circuit the process in the crucial area of ranking method implementation. Technical excellence must not be constrained by inappropriate schedules. Your assistance in these areas will restore public confidence and put this most important program back on track.

Testimony of

Steve Frishman, Director
Texas Nuclear Waste Programs Office
Office of the Governor
Austin, Texas

Before the
United States Senate
Committee on Environment and Public Works
Regarding Implementation of the
Nuclear Waste Policy Act of 1982

October 30, 1985
Washington, D.C.

The Nuclear Waste Policy Act of 1982 provides the affected states and Indian tribes a unique position in federal law in their mandated involvement in the process of siting, developing, operating and decommissioning a high-level nuclear waste repository system. The Act correctly recognizes the "essential" role of state and public participation in the decision process in order to promote public confidence in the safety of the disposal system. To date, there has been a declining level of public confidence in the U.S. Department of Energy's implementation of the Act, as a result of failures by DOE in two major areas addressed by the Act - the institutional process and the technical program.

Institutional Process

Since the presidential signing of the highly complex Nuclear Waste Policy Act, on January 7, 1983, there has been a growing tension between the affected States and tribes and the DOE managers. The tension is driven by the relentless insistence on the part of DOE to meet the proposed schedule of implementation which has proven to be exceedingly optimistic. Initially, the DOE insisted that all interim milestones would be met on time, including the acceptance of the waste in 1998. As each early date has passed, with significant delays in the DOE's products, such as establishment of site recommendation guidelines, the preparation of environmental assessments to support candidate site nominations, and the submission of a Mission Plan to Congress, the DOE has migrated to a position that all milestone schedules of the Act are advisory, with the exception of the requirement to hold the waste acceptance date firm. In the course of evolving this position, the DOE has violated the logic of the early consultation provisions and sequence established in the Act, with the result that state, tribal and public involvement have been hampered consistently by the inability to make comprehensive evaluations of the documents and decisions at hand. For example, the required Public Hearings, specifically designed to provide the public the opportunity to comment on issues that should be considered in the Environmental Assessments for candidate site nomination, were held a year and a half prior to the DOE's final site recommendation guidelines being established, and months before locations were established in Texas from which DOE eventually delineated sites. This limitation of the interested public's ability to make substantive comment regarding specific potential sites, and, within the context of siting standards, was not intended by the Act, yet was carried out by DOE with the aim of meeting the schedule for recommendation of sites for site characterization, an activity which is nearly a year late now. Another of the many examples involves the amount of time provided for State, tribal and public review of the 10,000-plus pages of the draft Environmental Assessments, which, although not required by the Act, were DOE's approach to mitigating the effects of the premature EA scoping hearings just described. Initially, in the name of the schedule, the review period was stated to be 60 days long, but after expressions of serious concern from nearly all affected parties, the review period was extended to 90 days, with the statement that some balance must be struck between reasonable public process and meeting the schedule. The DOE program director determined that 90 days of review time represented that balance, even when siting guidelines were finalized and sites in Texas had been identified only within the three weeks prior to release of the draft EAs.

Even with the sevnrely abbreviated comment period for the draft EAs, the affected states, tribes and public provided some 20,000 comments on the documents, most of which were of a substantive nature regarding missing or incorrect information and interpretations regarding the nine sites being evaluated. The DOE is now approaching its scheduled end of the process of writing Final Environmental Assessments, and attempting to not only account for the tremendous load of comments, but also develop an improved ranking methodology for recommendation of sites for characterization, since that used in the draft drew heavy criticism from a majority of reviewers.

Further erosion of confidence in the DOE implementation of the Act has resulted from the ongoing dispute between affected states and tribes over proper implementation of the "consultation" provisions in the Act. For expedience, DOE apparently has taken the view that consultation means essentially providing selected information, of DOE's own choosing, at a time when the DOE feels prepared to present the information. The affected states and tribes have taken consultation to mean the opportunity to be involved in the early stages of formulating decisions in the DOE program, in order to assure that all relevant information is considered in the decisions at hand. An example of the DOE's denial of meaningful consultation that has resulted in DOE having to make major revisions in its approach in finalizing the EAs is in the development of a methodology for recommendation of three sites for characterization. As early as August, 1983, during the guideline development process, some 14 governors and their representatives, and representatives of affected tribes, wrote to DOE suggestig a mechanism for developing, through consultation, a methodology for candidate site recommendation, and a timetable that was compatible with DOE's schedule at the time. DOE extracted a minor point out of the context of the letters, and refused to further consider this collective constructive effort. The price is now being paid in DOE's efforts to finalize the EAs, and will probably continue to be paid through inevitable challenges to the site selection decisions.

Technical Program

The Department of Energy waste program managers continue to cloak their constriction of the essential consultation process in statements regarding the need, under the Act's rigorous mandates (which have essentially been reduced by DOE to meeting the 1998 date for waste acceptance), to make trade-offs between consultation and cooperation, scheduling, and quality decisions, with the conclusion that quality decisions are at least equally, and probably more, important to the successful implementation of the Nuclear Waste Policy Act. We agree that there is a necessity for technical excellence in the planning for and development of a safe repository system, but also hold that technical quality, just as consultation and public involvement, is being sacrificed in the headlong rush to decisions leading to waste acceptance in 1998. The argument, regarding the technical credibility of the waste program to date can be expressed in two related observations. First, DOE has stated since before passage of the Nuclear Waste Policy Act, that it had sufficient information about sites under investigation to make the selection of three sites for detailed site characterization. And second, the DOE continues to maintain to the public that developing a repository system, including the site selection process, is a political problem, not a technical one. This is based upon the DOE perception that the technical program is simply one of applied engineering, using tested, off-the-shelf methodologies. We perceive much of the necessary work still to be in the realm of research and development for this first-of-a-kind facility, with the necessary approaches to planning and implementation to be unique in nature and scope.

It is particularly telling that, in the DOE's draft EAs, the amounts and levels of data and information available for the nine sites under consideration were found to be insufficient, under DOE's own less then precise guidelines, to permit DOE to base ranking considerations for candidate site selection on post-closure criteria, which are established in the guidelines as priority considerations. This has resulted from the established DOE approach of permitting itself the luxury of assuming site suitability in the absence of firm data that would disqualify a site at the simplest level of consideration. In addition, the EAs find that in respect to pre-closure guidelines for the highly significant parameter - hydrology, the data do not permit differentiation among the sites, with the exception of the only unsaturated site, at Yucca Mountain, Nevada, appearing appreciably more favorable. These examples, and many more found in the necessarily subjective judgements presented in the draft EAs, convince us that there are insufficient data available for DOE to recommend any of the current nine sites for characterization, and further that there is little basis to assume, at the current level of information, that any of the nine sites has a realistic potential to ultimately be found acceptable for repository development, through the regulatory and political process of the Act and other applicable federal laws, such as the National Environmental Policy Act.

The applied engineering assertion of the DOE regarding the waste program development has little to support it in light of the massive uncertainties of the data addressing the criticl geohydrologic parameters at the sites under current consideration. There seems to be a pervasive assumption on the part of the DOE that any serious geotechnical problems regarding the selected sites can be solved by conventional engineering "fixes" as they become necessary. This assumption is probably best exposed by the program schedule as represented in the Mission Plan recently submitted to Congress. The schedule is an outgrowth of the DOE's insistence on achieving the 1998 waste acceptance date, while the early activities under the Act have continued to slip in time. The result is a compression of the time allocated for the intense and necessarily rigorous work of site characterization, the licensing process and repository construction. Of critical importance is the fact that the schedule essentially contains no allowances for contingencies in the technical design and investigation program, while establishing such requirements as carrying out a full in-situ test program at a salt exploratory site within a period of only 8 months after shaft and drift construction is complete. The schedule also indicates that a repository site will be selected for recommendation to the President prior to completion of site characterization type work, further suggesting DOE's confidence in being able to satisfactorily engineer around any problems that may become known once the selected site is in the licensing process. This assumption of engineering "fixes" is not permissible under the DOE's siting guidelines at the decision stage of recommending three sites for site characterization, thanks to the Nuclear Regulatory Commission's insistence during its required siting guidelines concurrence proceedings. In those proceedings, the NRC clearly established that engineered barriers can only be considered to the extent necessary to satisfy Environmental Protection Agency and NRC criteria, and will not be considered to compensate for natural site deficiencies. However, DOE has taken the apparent position that if it does not know of specific problems assuredly needing "fixes" at this decision stage, it has technically complied with the guidelines that prohibit assuming engineering solutions will compensate for specific known problems at a particular site. This essentially says that a measure of programmatic success, i.e., meeting a schedule, at the decision level of candidate sites for characterization, is in the establishing of a suite of data insufficient to recognize critial problems at the sites under consideration. We take strong exception to the DOE's attempting to make any site selection decisions in the face of such a scientific and intellectual void.

Groundwater Protection Standards

The Environmental Protection Agency's Final Rule (40 CFR 191) setting environmental standards for the management and disposal of spent nuclear fuel, high-level and transuranic wastes, that was published September 19, 1985, has had a long history of evolution since the Proposed Rule was issued for public comment in December, 1982. After the close of the Public Comment period, there have been numerous working papers that have ultimately resulted in substantial changes in the rule which we and other interested parties had no formal opportunity to review and comment upon. DOE, however, did have a continuing set of interactions with the EPA in the finalization of the Rule, with some of their positions appearing to have ultimately prevailed.

Of great concern to Texas in the development and finalization of the EPA Rule has been how the rule addresses the matter of protection of groundwater at and around reository sites. The final rule has introduced groundwater protection requirements but then has taken excessive liberties in the applicability of those requirements to the extent that they appear to not apply to the valuable and limited waters of the Ogallala and Santa Rosa Aquifers at the DOE's identified potential sites in the Texas Panhandle. This giving with one hand and taking away with the other (which is epidemic in the final rule's substantial changes) is exemplified in the newly introduced definition of "Special source of ground water" [Sec. 191.12(o)]. The definition is as follows:

> "Special source of ground water," as used in this Part, means the Class I groundwaters identified in accordance with the Agency's Ground-Water Protection Strategy published in August 1984 that: (1) Are within the controlled area encompassing a disposal system or are less than five kilometers beyond the controlled area; (2) are supplying drinking water for thousands of persons (emphasis added) as of the date that the Department chooses a location within that area for detailed characterization as a potential site for a disposal system (e.g., in accordance with Section 112(b)(1)(B) of the NWPA); and (3) are irreplaceable in that no reasonable alternative source of drinking water is available to that population.

The application of this definition appears in Section 191.16 of the Rule, entitled "Ground water protection requirements", which establishes quantitative standards for radionuclide concentrations in a "special source of groundwater". If the definition is strictly applied there are some problems that emerge to the extent that the waters of the Ogallala and Santa Rosa Aquifers, which meet the definition in the Rule of "Significant source of groundwater", will be unprotected in the controlled area and within the five kilometer radius beyond the controlled area. First, the Ground-Water Protection Strategy does not provide clear protection of very small water systems nor does it apply to individual-use private supply wells, therefore, the major, irreplaceable water source in the vicinity of the DOE's identified sites exemplifies a fundamental flaw in the classification adopted by reference to the Ground-Water Protection Strategy. And, second, the qualification of the definition to supplying drinking water to "thousands of persons" is a bold and unsupportable contradiction of the intent of the Safe Drinking Water Act (and the recent enthusiastic Congressional moves for its reauthorization), which seeks to have any supply system that serves at least 15 connections or 25 persons subject to protection standards. Interestingly, the "thousands of persons" standard seems to be a result of DOE negotiations with EPA over the final rule, after the public comment period closed. In a September 18, 1984 meeting between representatives of DOE and EPA, DOE was apparently seeking to further weaken, through an erroneous assertion, the intent for applicability of the Safe Drinking Water Act, and the EPA's interim drinking water standards (40 CFR 141). The obvious reason for the DOE effort was to relax ground water protection standards to the point that the Final Rule would not be applicable to existing DOE identified sites underlain by "significant sources of groundwater", such as the Deaf Smith and Swisher County sites in Texas. The summary of the pertinent ground water requirement comment on September 19, 1984, appears as follows in the minutes of that meeting (identified as II-E-31 in the EPA Docket Number R-82-3): "Risk levels based on large population assumptions (EPA's interim drinking water standards - 40 CFR 141) inappropriately applied to low population/intrusion scenario." The interim drinking water standards are intended for application at the minimum level stated above, and DOE is inappropriately attempting here to reinterpret that intent to serve its own singular purpose without regard to the fact that it represents a significant weakening of an already weak regulatory framework with respect to protection of ground water sources accessed primarily by individually owned supply wells.

In Texas, as you are aware, our concerns about the DOE's identified sites arise from some major concerns in the areas of geotechnical evaluation and potential adverse socioeconomic impacts - both of which have direct and indirect ties to the necessity to protect the underground water supplies available from the Ogallala and Santa Rosa Aquifers. The vast agricultural production of the Texas Panhandle is dependent on available high-quality water from these aquifers for irrigation and human and livestock use. Deaf Smith County, which contains one of the three sites DOE has proposed for site characterization, and from which DOE expects to select a high-level waste repository site, is consistently ranked second in the nation in cash receipts for crops and livestock, is a portion of the Texas Panhandle area that provides upwards of 85% of the world's supply of hybrid sorghum seed, and the particular site encompasses one of a number of contiguous sections (square miles) of a nationally unique foundation grain seed farm that significantly enhances this nation's wheat production capability. Our concerns about the validity of DOE even continuing to consider the two prime farmland sites in Texas become even more acute when we see DOE attempting to "protect" its sites that were identified prior to finalization of the EPA high-level waste rule, by attempting, with some successes as indicated above, to manipulate the standards under which it must substantiate a reasonable assurance of compliance. We are even further concerned about DOE's intent and technical credibility when faced with another of DOE's objections summarized in the same meeting minutes identified above regarding ground water protection requirements in the developing EPA Rule. The summary of that DOE comment to EPA is as follows: "Difficult to demonstrate compliance analytically - Predictive uncertainties highest during the first 1,000 years during which requirements apply." This gives us no confidence in DOE's assurances that the irreplaceable ground water in the vicinity of Texas sites can be protected, and makes us even more firm in stating that the sites and their vicinities should not be subjected to the potential risks of the DOE waste repository program when the exercise is not necessary at these particular sites, and especially when the sites carry some probability of not being suitable for an acceptable license application to the NRC regardless of the minimum radionuclide concentration standard of the EPA, even if it is established to be applicable to the sites.

The EPA has caused us additional concern about the Final Rule relative to the agricultural base of the Texas Panhandle sites and their vicinities. In an apparent attempt to inject a guise of objectivity into the rationale for the Rule, when the sites under consideration by DOE were well known, and the major existing site selection issues had already been identified, EPA analyzed, in its *Background and Information Document* for the final Rule, the potential exposure effects of ingestion of food raised on irrigated land. While knowing that the Texas sites are irrigated entirely by groundwater from the Ogallala and Santa Rosa Aquifers, the EPA chose as its standard of analysis a percentage close to the national average of river flow diverted as a source for irrigation, and essentially ignored the more concentrated groundwater source case, thus providing highly diluted projections of exposure that do not address the real situation that could exist from contaminated groundwater in the vicinity of the sites.

With the DOE's having incorporated the EPA Rule 40 CFR 191 into its guidelines for recommendation of sites, based upon the early assumption that the Final Rule would be substantially the same as that proposed in 1982 (which has proven to be an incorrect assumption), and then EPA affording DOE the opportunity to uniquely influence the substance of the Final Rule, two principle questions come to mind. First, does the EPA Rule adequately protect the environment based upon objective and conservative standards. or does the Rule simply serve to protect the continued viability of DOE's potential candidate repository sites that were identified long before the substance of the Final Rule was established? We, unfortunately feel that the Final Rule represents a back-fitting of the standards to the sites, at least in the area of ground water considerations. And second, does the EPA Rule, in conjunction with the DOE's site recommendation guidelines, provide the Secretary with a basis to comply with the requirements of Section 124 of the Nuclear Waste Policy Act, regarding the need to give full consideration to whether the DOE's repository program activities require acquisition of water rights that will have a significant adverse effect on the present or future development of the area of a repository, and, if so, can the adverse effects be mitigated maximally? Again, we feel that there has been a failing, as the EPA Rule virtually assures that DOE can use the ground water at the vicinity of the site as a temporary contamination dilution medium with no requirements to clean up contamination that may adversely impact the agricultural development and use of the area, i.e., no intent to mitigate the adverse effects.

Monitored Retrievable Storage

While DOE has yet to make a proposal to the Congress regarding construction of a monitored retrievable storage facility, such a proposal is scheduled by DOE for January, 1986. The information currently available from DOE indicates that a facility will be proposed that is integral to the repository system in the sense that many of the operations that otherwise would be required to be carried out at a repository surface facility will, instead, be conducted as the spent fuel is emplaced at the MRS. The relative merits of this approach will be examined by the Congress, with one of the attributes of such a proposal being that it could, with the proper guidance from Congress, serve as a means of relaxing the DOE's headlong rush to opening the doors of a repository by 1998, and permit at least the opportunity for a much needed improvementin the substance of the program of technical investigation.

The MRS proposal could also have an additional benefit in improving DOE's relationship with some states regarding concerns over the current uncertainties in waste transportation planning. In the draft Environmental Assessments, the DOE's transportation analyses are developed in a simplistic, generic approach that has no real influence in the repository siting process, and provides no useful information to the so-called corridor states through which waste will be transported to either an MRS and repository, or just a repository. The MRS proposal could result in DOE attempting to make transportation route and mode decisions much earlier than in the case without and MRS, and likely would result in some of the currently concerned states either being removed from exposure to future major waste shipments, or gaining an improved position in consulting with the DOE regarding its waste transportation plans and their potential impact on state emergency planning and management programs. To date, DOE has deferred dealing with any specific transportation issues as they affect potential corridor states, and maintains that the issues will be highlighted during the repository characterization process when there are only three sites being considered. An MRS proposal that announces a proposed location could provide considerable transportation information as part of its operational design that otherwise would not become available until considerable progress is made in site characterization. This information will also be of significance to states with repository sites under consideration, because, as yet, the transportation mode, or modal mix represents a great uncertainty in evaluations of potential transportation impacts in the vicinity of a potential repository site.

It must also be remembered that there are interests considering a broad range of issues regarding an MRS proposal, and a matter of continuing significant concern relates to the intended role of the MRS in the overall waste disposal program. Just over a year ago, the then Secretary of Energy was referring to an MRS as a fall-back position if the repository program is significantly delayed, and there are those who view the intent of the Act to serve this position. The more recent DOE approach is that the MRS would be an integral part of the repository system, adding efficiency to the overall development and operation of a waste management and disposal system, while de-emphasizing the fall-back aspect of the consideration. In either case, there is significant concern on the part of a number of affected parties that the MRS development would remove the incentive for DOE to make timely progress in repository development, and that the MRS would become a long-term storage facility with no clear track for removal of the waste to a disposal facility. The DOE's current response to this concern is that the MRS would be sized to limit the amount of waste in storage at any one time, thus keeping up the same level of pressure for a repository as now exists. This response does not allay the concerns of those who fear a long-term storage scenario developing, since additional Congressional authorizations could result in expansion of an MRS at any time it was determined to be necessary, or even desirable. Other temporary storage options are also being examined by both DOE and the affected utilities, however, at this point, DOE seems to be committed to an MRS authorization proposal to the Congress.

Conclusion:

There is continually growing concern over the DOE's implementation of the Nuclear Waste Policy Act, both from the institutional and technical standpoint. Not all parties are dissatisfied for the same reasons, yet there seems to be an increasing level of pessimism regarding the potential to develop a high-level nuclear waste disposal facility under the current confidence and credibility crisis that is being continually described to Congressional oversight committees. And the crisis appears to be just beginning, with the prospect of major legal challenges to DOE's site selection activities and decisions only awaiting the release of the final Environmental Assessments. Already the site recommendation guidelines are the subject of a suit joined by nearly all affected interests in the first repository selection process, and some in the second. The site screening process, in advance of site nominations has been challenged and currently stands dismissed on the basis of a finding that the review was not timely. This decision has now been appealed.

It is our view that the intent and letter of the Nuclear Waste Policy Act demands technical excellence, which has yet to be exhibited relative to the nine sites now being narrowed for a selection of three to be recommended for site characterization. The Act also correctly recognized that without a public process involving, in a meaningful and substantive manner, all the affected parties, the essential element of public confidence is missing from the equation for success. Again, it is our view that the public process has been unacceptably compromised, to the point that public confidence has been severely wounded, maybe to an unrecoverable extent for the next few decades.

This combination of failures, seems to demand attention, even though the program managers have yet to acknowledge the depth and the seriousness of the problems. Congress is being increasingly encouraged to provide guidance to DOE for a course correction in the DOE implementation of the Act that would call for a re-evaluation and possible revision of components of the site selection process before sites are finally selected for characterization. The real costs in time and dollars of this approach should be evaluated and carefully weighed against the increasing likelihood of long program delays and the prospect of ultimate failure in meeting the national goal of safely disposing of the nation's accumulating inventory of high-level nuclear wastes.

TESTIMONY
OF THE
STATE OF MISSISSIPPI
BEFORE THE
COMMITTEE ON ENVIRONMENT & PUBLIC WORKS
UNITED STATES SENATE
WASHINGTON, D. C.

Presented by

John W. Green, Jr.
Interim Director

Mississippi Department of Energy & Transportation

October 30, 1985

JOHN W. GREEN, JR.
TESTIMONY BEFORE THE
COMMITTEE ON ENVIRONMENT & PUBLIC WORKS
UNITED STATES SENATE
WASHINGTON, D. C.
October 30, 1985

Mr. Chairman and Members of the Committee:

I am John W. Green, Jr., Interim Executive Director of the Mississippi Department of Energy & Transportation. I appreciate the opportunity to appear before you today to present a statement on behalf of the State of Mississippi regarding the Department of Energy's (DOE) Civilian Radioactive Waste Management Program. The State of Mississippi has been contending with DOE on this matter for eight years now, and it would be virtually impossible in this brief hearing to fully cover all the issues which Mississippi and, I'm sure, the other states and Indian tribes, would like to have presented today. I will attempt to briefly address the Mission Plan, the site selection process, transportation, and the EPA Standards.

The Mission Plan has been formally submitted to the Congress by the DOE as the document by which DOE will attempt to implement the Nuclear Waste Policy Act of 1982 (NWPA). Yet, I do not believe this document accurately depicts the current state of the high-level radioactive waste program, nor does it provide an information basis sufficient to permit informed decisions to be made.

To begin with, Mississippi and other states requested DOE to publish the Comment Response Document prior to submitting the final Mission Plan to Congress, but DOE refused. It has consistently been the position of this State that Congress, in Section 301(b) of the NWPA, intended the Secretary to submit the comment responses to the public before submitting the final Mission Plan to Congress.

One of the greatest areas of concern to us in Mississippi, and one that we feel has not received credible attention, is the socioeconomic impacts of the DOE program in the past, as well as the anticipated impacts in the event a repository is constructed. The Mission Plan deals extensively with geologic, hydrologic, geochemical, and geomechanical research; but no similar research in socioeconomics is mentioned. This is justified by saying it is difficult for socioeconomists to make accurate assessments for periods covering 90 years or more. However, DOE ignores the fact that physical scientists are also having difficulty predicting whether a disposal canister will be able to contain high-level nuclear wastes without leakage within 30 years - nuclear engineers can't accurately predict the cost of nuclear power even ten years into the future.

Also of great concern to Mississippians regarding socioeconomic impacts is the extent of impacts already realized in our state, and particularly in the areas proximal to the repository sites under consideration. Mississippi has repeatedly requested funding to conduct a socioeconomic evaluation of the areas surrounding the two salt domes under consideration for a repository in order to determine the scope and extent to which the citizenry, as well as their property and life styles, have been affected by the DOE activities. Our requests have not been to gather data about conditions which might exist in the future during site characterization or construction or operation of repository. We simply sought adequate funding to find out what has happened to date. The Department of Energy has, in grant awards to other of our sister states, approved requests for socioeconomic studies in areas where the direct impacts upon people don't exist. Even in our most recent attempt at a meeting in Mississippi on October 21, 1985, to obtain funds from DOE to perform this "much needed" study, a DOE official finally acknowledged that our request was not unreasonable and agreed to sit down and "consult" further with us, only to return to Washington and call back the next day to say the present level of funding was adequate, without the promised consultation.

The Richton, Mississippi, site is the only site that has people, residential dwellings and other structures, and a portion of the town itself physically situated over the geologic feature in which DOE is considering a repository. This is the reason that the socioeconomic impacts are of such great concern to my state. Our people may become the threatened and endangered species.

A topic of considerable concern to all with whom I have come in contact in this program is the provision in the Nuclear Waste Policy Act for "consultation and cooperation". We have always believed that Congress intended that "consultation" be a two-way flow of information in the form of deliberation. However, the Department of Energy has not applied this definition to the process. It merely tells us what it is going to do, whether we like it or not. This attitude on the agency's part eliminates the possibility of an exchange of information and ideas. The main thing we consistently have been denied is a chance to influence DOE processes as they take shape. The states and tribes are drawn into the process in an after-the-fact "review and comment" posture.

A prime example of this lack of "consultation and cooperation" is portrayed in the development and implementation of the methodology for ranking sites. Specific representations were made to Mississippi officials, before Mr. Rusche's appearance on the scene. Mississippi and our sister states were told we would actually help develop the scientific criteria and methodology for site selection and ranking. This promise was never kept. The states and tribes had the opportunity to critique two of the preliminary drafts of only four of the seven chapters prior to the publishing in December 1984 of the draft Environmental Assessments. When the states asked to review the other three chapters, which contain the information on site selection and ranking, the Department of Energy flatly refused. On November 2, 1984, the DOE headquarters office announced that they had internally agreed upon a "methodology" for ranking sites. The DOE offered to conduct a meeting in Washington, D. C., to "explain" this methodology. The Department refused to allow the states to review and critique these chapters as had been done in the past. Thus, we were refused the opportunity to aid in any way development of the ranking methodology. We viewed this as a "notification" process and did not meet with headquarters staff on this issue. This is not the only example of the lack of "consultation" - but it is a glaring one.

A matter closely related to consultation and cooperation is that of information sharing with the public. DOE represents in their Mission Plan that they have attempted "full, open, and timely sharing of technical information". Mississippi had to file a Freedom of Information Act (FOIA) request in early 1980 to begin the process of obtaining technical information from DOE regarding work that had been done at the two sites in our state.

The most recent example of DOE's lack of information-sharing includes the Environmental Assessment process. As previously mentioned, DOE provided the states and Indian tribes only four of seven chapters of the draft Environmental Assessments prior to the release of these documents for public comment. A 90-day public comment period was allowed, but this period included the Christmas holiday season, thus decreasing the number of days available for review. In addition, an adequate number of these documents was not provided for review for another 30 days after their release. Some major references were not provided until almost the end of the comment period.

Another matter closely related to consultation and cooperation, as well as public-information sharing, is peer review. Mississippi and other states have, for a long time, seriously questioned the peer review aspects of the DOE program. The Mission Plan indicates that the states and Indian tribes are expected to constitute a major peer group of the DOE program. If this is to occur, then the states and Indian tribes must be given adequate funding to engage in peer review, as well as ample time to critique the work product generated by DOE. Our definition of "peer review" is "an opportunity to influence the product". This opportunity has not been given to the states and Indian tribes.

There is little evidence in the Mission Plan to indicate outside peer review has been applied. Our first real indication that DOE was using peer review occurred recently when DOE submitted the ranking methodology to the National Academy of Sciences (NAS) for its review. While this process could be applauded, it is rather belated since the final Environmental Assessment is scheduled to be released in December of this year. Mississippi must be skeptical about how much the NAS peer review can influence the ranking methodology at this late date.

A major concern is the apparent enslavement of DOE to meeting the 1998 deadline prescribed by the Act. It is now obvious that DOE, even if it had operated efficiently to date, would have been hard pressed to come close to meeting the congressionally mandated timetable. The program has been plagued with one major problem after another, including the successive turnover of at least four headquarters' regimes. The only way to get the program back on the mandated schedule is to short-cut the entire process. The DOE has violated the Act by missing major milestones, while at the same time short-circuiting other portions of the program to regain lost ground. An example of this is the schedule set forth in the Mission Plan for in-situ testing in salt. Only eight months are scheduled for in-situ testing in the salt program, while 26 months and 24 months are scheduled for similar studies in tuff and basalt, respectively. DOE attempts to justify the abbreviated testing period in salt by using generic data obtained from research in West Germany, Kansas, and New Mexico. Since a goal of site characterization is to gather data for the purposes of an environmental impact statement to satisfy the requirement of the National Environmental Policy Act, we maintain that the data must be site specific, not generic.

Additionally, the Mission Plan allows only 27 months for an NRC review of the license application for a repository. The Nuclear Waste Policy Act, in Section 114(d)(2), allows the NRC three years, with a provision for an additional 12 months, if needed, to complete the process. Again, DOE reflects its preoccupation with the schedule rather than the technical credibility of its own program.

Further, the Department of Energy is ambiguous in the information presented in the Mission Plan regarding the timing of technical studies to be conducted during site characterization. Mapping, seismic studies, geochemical testing of groundwater, and other investigations should be conducted prior to sinking of any exploratory shafts to ensure the proper location of the shaft which could become a part of the repository. If such studies are conducted prior to the sinking of a shaft, we believe that the schedule would be somewhat protracted. We also believe that this may be the reason that the Department may be planning to conduct these studies concurrently with sinking the shaft. Public confidence could be better established by demonstrating that public health and safety and the environment can be protected than by meeting an arbitrary timetable.

The principal and most costly aspect of site characterization is sinking exploratory shafts into the host media. The Mission Plan is vague about DOE's intent regarding the use of exploratory shafts after their investigative purpose. DOE may be considering incorporating these shafts and/or drifts into the repository itself. This decision may violate 10 CFR 60.3(b), Subpart A, which requires the filing of an NRC application before DOE commences construction of a repository. Since construction of the first exploratory shaft at the basalt site will begin in August 1986, the Department of Energy should decide whether it will incorporate or completely backfill the shafts. In the event that the shafts are incorporated, we are concerned that they may not meet the quality assurance requirements needed for a repository.

Another technical concern not adequately addressed in the Mission Plan is the retrievability option required by 10 CFR 60.111(b)(1). One of the major reasons salt was proposed for study by the National Academy of Sciences in 1957 concerns its "natural healing" properties. The tendency of the salt to heal or "creep" has been offered as a plus for this medium, but DOE has failed to demonstrate how salt creep would not cause problems in the future and possibly prevent retrieval of waste prior to the lapse of the 50-year statutory retrievability set forth in the NRC regulations.

We continue to be concerned about the weakness of the DOE program regarding transportation of high-level radioactive waste. Not nearly enough has been said by DOE regarding upgrading (and associated costs therefor) of a state's transportation infrastructure. The DOE has just commenced developing plans for the transportation of high-level radioactive waste to a repository. Yet, Congress is expected to take action on the Mission Plan with its references still incomplete. The State of Mississippi's policy is that transportation should be monitored in order that state laws, notably those pertaining to prenotification and permitting, may be enforced regarding radioactive waste transportation.

One of the greatest unknowns in the Mission Plan is the amount of tax dollars to be taken from the American public to fund the Department of Energy's Civilian Radioactive Waste Management program. It must not be forgotten that this entire program which this Committee is scrutinizing today is being paid for by American citizens whose income is being reduced by utility payment surcharges to support the entire DOE high-level radioactive waste program. The Mission Plan is misleading the public by suggesting that this program is being funded by the nuclear utility industry. The Mission Plan could be improved by adding an analysis of the monies available to the federal government through the nuclear waste fund, and a comparison of such revenues versus possible anticipated or unanticipated scenarios.

The State of Mississippi has several concerns with the Environmental Protection Agency's Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes (40 CFR 191). The standards as promulgated in final form pose less stringent standards on DOE licensed facilities than on NRC licensed facilities. There may also be some problems with the section dealing with the protection of groundwater resources. In the section entitled Groundwater Protection Requirements (40 CFR 191.16), "special sources of groundwater", which consist of irreplaceable and ecologically vital aquifers, are exclusively protected. In addition to these sources, perhaps EPA should address standards for "current and potential sources of drinking water and waters having other beneficial uses". The Assurance Requirements (40 CFR 191.14) have only been applied to non-NRC licensed facilities. Also, there is a failure to fully discuss monitoring for contamination.

The Committee should bear in mind that DOE made no attempt to enlarge the scope of its site investigation program after the Nuclear Waste Policy Act became law. Indeed, DOE at that time had only nine sites in six states under consideration and simply confined its examination of possible repository sites to those already being examined. Absolutely no attempt whatsoever has yet been made to conduct a nationwide screening process in order to evaluate any and all sites in the United States wherein a geological repository for high-level nuclear waste might be constructed. What this means, in short, is that there is a strong likelihood that there are sites other than those now being considered for the first repository which might be far superior, from a scientific, environmental, economic, and even political point of view, but aren't even now being studied. Moreover, in the event that only one repository is ever built, this means that unless all possible sites are evaluated, such a facility would probably not be built where it should be. Thus, the United States Government, through the actions of the Department of Energy, would actually have done what has been so often charged in this program - find the most expedient means and geographic location to dump nuclear waste material.

Another area I would like to address is the site selection process for the first repository. Many of the members of this committee represent the states being considered for the second repository. The experience Mississippi and our sister states, under consideration for the first repository, have had may give you insight into future expectations with the second repository program. DOE has made many promises that they have later found it more convenient or expedient to break.

In November 1982, Mississippi representatives met with officials of both the DOE and its principal contractor, Battelle Memorial Institute, to discuss issues regarding scientific studies which were contemplated for the "location phase" of the repository project. Also at this meeting were representatives of a "peer review" group which had been established by DOE. Mississippi was the only state represented at this meeting. After a full morning of discussion regarding matters which state representatives felt should be incorporated into the "location phase" of DOE's studies, federal officials announced early in the afternoon session that they were cancelling this entire aspect of the repository program. No explanation or justification was given for this action.

Another promise made concerned the Site Recommendation Report whereby DOE would discuss the scientific criteria and methodology for site selection and ranking. It was promised by Mr. Robert Morgan, then the Acting Director of the DOE program, that the states would actually help develop this report. When Mr. Ben Rusche became the Director of the DOE program, this commitment was abandoned without prior notice to or discussion with any affected states or tribes.

My discussion of the Mission Plan gives you further examples of the problems Mississippi has had to contend with while trying to fulfill their role in this process as specified in the Nuclear Waste Policy Act of 1982.

Again, thank you for the opportunity to appear before you today. I respectfully request that you give careful attention to those matters I have discussed in this statement, and I will be happy to supplement or amplify any of these points if you so desire.

STATEMENT OF

WALLACE E. BEHNKE

VICE CHAIRMAN, COMMONWEALTH EDISON COMPANY

ON BEHALF OF

EDISON ELECTRIC INSTITUTE

AMERICAN NUCLEAR ENERGY COUNCIL

UTILITY NUCLEAR WASTE MANAGEMENT GROUP

AND

ELECTRIC UTILITY COMPANIES'

NUCLEAR TRANSPORTATION GROUP

ON

CONGRESSIONAL OVERSIGHT OF IMPLEMENTATION OF

THE CIVILIAN NUCLEAR WASTE MANAGEMENT PROGRAM

BEFORE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

OCTOBER 30, 1985

Mr. Chairman and members of the Committee: I am pleased to have the privilege of appearing before you today to testify on the Department of Energy's implementation of the Nuclear Waste Policy Act of 1982. My name is Wallace B. Behnke and I am Vice Chairman of Commonwealth Edison Company. My testimony is presented on behalf of the Edison Electric Institute (EEI), the American Nuclear Energy Council (ANEC), the Utility Nuclear Waste Management Group (UNWMG), and the Electric Utility Companies' Nuclear Transportation Group (NTG).

EEI is the national association of investor-owned electric companies. Its members serve approximately 73 percent of all ultimate electric customers in the nation. EEI's membership includes the majority of DOE's nuclear waste services customers.

ANEC represents over 100 organizations having an interest in nuclear power, including investor, public and cooperatively-owned utilities, manufacturers, architect-engineers, and various firms in the nuclear fuel cycle.

UNWMG is a specific activity that is funded by 46 utilities with nuclear programs, including EEI member companies, public utilities, and cooperatively-owned utilities. Its sole purpose is to oversee the implementation of the Nuclear Waste Policy Act and to assist in the resolution of spent fuel storage and nuclear waste disposal issues.

NTG represents 37 investor-owned and publicly-owned utilities. A prime objective is to provide review and comment for DOE's spent fuel transportation activities.

We greatly appreciate this Committee's continued interest in and oversight of DOE's implementation of the Nuclear Waste Policy Act. The success of the DOE commercial Nuclear Waste Program is vital to the nation's 121 nuclear units -- those in commercial operation in the testing phase, and under construction. It is the nuclear power utilities that presently fund the Nuclear Waste Program at an annual rate of approximately $350 million by way of the one mill per kilowatt-hour fee. Thus, the nuclear utilities and their electricity customers are bearing the cost of this program and have a vital interest in its successful, timely, and cost effective implementation.

DOE's blueprint for implementation of the Nuclear Waste Policy Act is set forth in the Final Mission Plan. While DOE's Mission Plan is a credible document, there are serious implementation issues that are yet to be resolved. Our comments are not so much a criticism of DOE's efforts -- much of what has been accomplished thus far is commendable -- as an outline of issues that must be addressed to meet the intent of Congress when it enacted the Nuclear Waste Policy Act.

In my testimony today, I would like to focus on only eight of the issues that we believe are important to the overall success of the Nuclear Waste Program:

- Schedule delays
- DOE fiscal management and cost control
- Cost allocation for defense wastes

- Timing of DOE's preliminary determination of site suitability under Section 114(f)
- Licensing strategy for geologic repositories
- Transportation issues raised by S.1162
- Independent review of DOE's repository site evaluation methodology
- Environmental Protection Agency standards

Schedule Delays

The Nuclear Waste Policy Act included detailed schedules for federal actions needed to meet the Act's objectives. These schedules were not peripheral to the Act but were the central method chosen by Congress to achieve the availability by 1998 of the first geologic repository. One of the Act's purposes is "to establish a schedule for siting, construction, and operation of repositories that will provide a reasonable assurance that the public and the environment will be adequately protected from the hazards posed by high-level radioactive waste and such spent fuel as may be disposed of in a repository...."[1] Congress in 1982 believed the schedules established were "realistic and workable" and fully expected "the involved agencies to do everything possible to assure that [the] schedule is met."[2] Unfortunately, missed deadlines and schedule slippages have become the rule for the Nuclear Waste Program.

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[1] Nuclear Waste Policy Act, §111(b)(1), 42 U.S.C. §10131 (1983).

[2] S. Rep. No. 282, 97th Cong., 1st Sess. 21 (1981).

Section 114(e) of the Act requires DOE to prepare a Project Decision Schedule setting forth "the optimum way to attain the operation of the repository involved, within the time periods specified" and to report to Congress any failure of a federal agency to comply with a deadline. DOE has not complied with Section 114(e) of the Act. The July 1985 draft Project Decision Schedule neither reflects the statutorily-mandated schedules nor DOE's schedule problems. Rather, the draft Project Decision Schedule establishes the "reference schedule" for repository site recommendation at March 1991 -- four years later than the deadline established by Congress in the Act.

We would hope that this Committee would encourage DOE to comply as closely as possible with the schedules established by Congress and to set forth the optimum means for compliance with the deadlines established in the Project Decision Schedule. DOE should fully comply with Section 114(e) and report to Congress all schedule problems, including those of its own making. We would strongly suggest that this Committee in its oversight capacity require DOE to report both actual and potential schedule problems and to submit for Congressional information the means proposed to correct or compensate for factors inevitably leading to schedule slippage.

The consequences of schedule delays are significant. Program cost will increase. The public confidence in the federal government's ability to manage nuclear waste disposal will erode. To avoid these impacts, we believe that DOE must develop and exercise greater centralized project management over the entire Nuclear Waste Program. This will significantly improve the likelihood that current schedules can be maintained.

DOE Fiscal Management and Cost Control

The most recent estimates of the cost of the Nuclear Waste Program are between $23-$29 billion. The Nuclear Waste Policy Act directed that these costs be paid by those who benefit from the use of nuclear energy -- the owners and operators of civilian nuclear power reactors on the one hand and the United States defense programs on the other. The fee for commercial power reactors is one mill per kilowatt-hour on all electricity generated and sold from commercial nuclear power plants. In addition, DOE has received about $1.4 billion for the one-time fee payments for spent fuel generated prior to April 7, 1983.

Thus, consumers are now paying for services that the federal government has promised to provide at some future time. We are concerned that DOE has yet to establish a systematic program for controlling the costs of these services. For example, eighty-five percent of the cost of the Nuclear Waste

Program is spent on contractors and subcontractors, yet DOE has not established effective centralized management control over program contracts. The most recent fee adequacy report fails to reflect the impact of potential additional costs (such as the MRS) and additional program revenues from defense waste contributions and interest on the large payment of one-time fees. Our concerns are shared by the National Association of Regulatory Utility Commissioners.3/ However, we are pleased that DOE is establishing a policy for grants to States and Indian Tribes.

We would recommend that DOE consider the following steps to establish increased management control and fiscal accountability for the Waste Management Program:

- Establish centralized DOE management for strategic planning, policy guidance, fiscal and schedule control, and coordinating all involved federal agencies.
- Perform systematic and continuing audits of contractors and subcontractors, as suggested by GAO.
- Establish clear and specific DOE guidelines for grant applications by States and Indian Tribes for both the first and second repository.

3/ Testimony of Edwyna G. Anderson, National Association of Regulatory Utility Commissioners, Before the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs, page 10 (September 13, 1985).

Cost Allocation for Defense Wastes

The President has determined that high-level radioactive waste resulting from atomic energy defense activities and civilian spent fuel and waste should be disposed of in the same geologic repositories. However, DOE has not yet addressed the cost allocation or acceptance schedule impact that this decision creates. The proper allocation of costs between civilian and defense wastes is a multi-billion dollar issue. The acceptance schedules for defense wastes may well have a significant impact on the civilian spent fuel backlog. DOE treats this important issue with a non-committal statement in its Mission Plan:

> Negotiations are underway with other DOE offices to both establish an equitable cost-sharing method and to develop a waste acceptance schedule that integrates the two major waste streams.4/

The utilities share the concerns expressed by the National Association of Regulatory Utility Commissioners5/ that these internal negotiations between the DOE Division of Defense Programs and DOE Office of Civilian Radioactive Waste Management may be no more than an exercise in creative accounting to justify that the lowest possible cost is allocated to defense

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4/ U.S. DOE, Mission Plan for the Civilian Radioactive Waste Management Program, Volume I at §2.5.1 (June 1985).

5/ *See* NARUC testimony, *supra*, note 3, at 17.

wastes. We are concerned that an equitable and realistic basis for cost sharing will not evolve, especially since DOE's overriding interest would seem to be minimization of the direct impact on its own budget.

We ask this Committee to encourage DOE to pursue an open process that would involve the utilities directly in the consideration of an equitable cost-sharing approach. The utilities are the real party of interest. We have offered to work with DOE to develop a reasonable cost allocation formula. The results of this process should be subject to public comment and Congressional scrutiny -- especially since Congress will have to authorize the Waste Fund payments for defense waste disposal.

The defense waste cost allocation issue has two aspects: the allocation formula and the timing of payments to the Waste Fund. One suggestion being considered by DOE would base the defense waste share on the percent total curie content of waste at the time of disposal. The one mill per kilowatt-hour fee for civilian spent fuel, however, is essentially a fee on the total curie content at the time of discharge from the reactor core. Thus, an allocation based on the total curie content at disposal would credit defense waste with radioactive decay without allowing any such credit to civilian spent fuel. This would give DOE's defense programs a substantial "free ride" at the expense of electric utilities and their customers.

The utilities submit that an appropriate cost allocation approach should be based on the primary characteristic DOE utilized to justify commingling defense and civilian waste -- cost savings. Cost savings resulting from the combined operations -- compared to the overall cost of separate disposal systems -- should be shared in proportion to the cost estimate for the separate facilities. We describe this approach in more detail in Attachment A of this testimony.

Our preliminary analysis concludes that defense waste should bear about one-third of the cost of the geologic repository program. The nuclear industry is not looking for a subsidy from the defense side, nor do we desire to subsidize them. We look forward to working with DOE in negotiating a reasonable and equitable arrangement, which under any outcome must be subjected to broad public and Congressional scrutiny.

The timing of payments into the Waste Fund for defense wastes should be comparable to commercial payments. A one-time fee, similar to that required by the utility contracts, should be paid into the Waste Fund for all defense waste generated prior to April 7, 1983 in a manner similar to the civilian payments and should include interest from June 28, 1985. Other fees should be paid quarterly -- according to an equitable billing formula.

Timing of DOE's Preliminary Determination of Site Suitability Under Section 114(f)

During the NRC's concurrence process for the geologic repository site selection guidelines, a question was raised regarding the interpretation of Section 114(f) of the Nuclear Waste Policy Act: Must DOE's "preliminary determination" that three "alternative sites" considered in the Environmental Impact Statement are "suitable for development as repositories" be made prior to, after completion of, or at some time during site characterization? The DOE Mission Plan clearly answers this question -- the preliminary determination of site suitability is to be made by DOE at the time DOE recommends three sites to the President of the United States for site characterization. DOE's statutory interpretation was strongly endorsed in a letter to the Secretary of Energy on June 26, 1985 and signed by Senators McClure, Simpson, Domenici, and Johnston. That letter clearly and unequivocably stated that the intent and understanding of Congress for the inclusion of a requirement that the Secretary make a "preliminary determination" as to site suitability was:

> [M]erely to provide a safeguard against the Secretary simply focusing all of his attention and resources on a single site that he was already predisposed to select for construction of a repository.6/

6/ Letter from Senators McClure, Domenici, Simpson and Johnston to John Herrington, Secretary of Energy (June 25, 1985).

We agree with DOE's interpretation. We also appreciate the effort of these Senators to clarify the understanding under which they approved inclusion of the language regarding a preliminary determination. We append to this written statement as Attachment B an elaboration of our understanding of the legislative history of Section 114(f) and the proper statutory construction of that provision.

While the last-minute compromise language of Section 114(f) may not be a model of clarity, the unambiguous intent of the Nuclear Waste Policy Act is clearly the characterization of three sites and the selection of one of those three for the first geologic repository. Congress specifically provided deadlines for DOE in siting, licensing and constructing the repository. While a different interpretation by Congressmen Dingell, Markey, Swift and Udall may be a legitimate reading of the words in isolation, it ignores the purpose, structure and mandate of the Act -- to establish a geologic repository for the safe, environmentally sound isolation of nuclear waste by the year 1998. Their interpretation of Section 114(f) to require a preliminary determination after three or four years of site characterization is an odd use of the word "preliminary" and at the same time, exults process over program objectives.

If the preliminary determination were to be required after site characterization, the entire process of site selection becomes subject to an unacceptable risk that the mandated schedules of the Act will not be met. DOE would be required either to characterize more than three sites, which is inconsistent with the explicit language of the Act, or face the unacceptable risk of large schedule delays and huge cost uncertainties should one of the initial three sites be found unsuitable. The interpretation by DOE, as reaffirmed by Senators Simpson, McClure, Johnston and Domenici, is the only statutory construction consistent with the overall purpose, structure, and mandate of the Act.

Licensing Strategy for Geologic Repositories

The Nuclear Waste Policy Act provides in Section 114(d) that NRC licensing to authorize construction of the first repository be completed within three years after submission of a license application, with a limited extension of up to 12 months for good cause. DOE's Final Mission Plan assumes that NRC licensing can be accomplished within 27 months. NRC Chairman Palladino in his testimony before a Senate committee recently stated NRC's position that:

> The three years provided by the NWPA is a very optimistic estimate for the time required to reach a licensing decision on repository construction.... We have not identified at this time specific actions which would permit the license review period to be reduced from the statutory 36 months.[7]

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[7] Testimony of Nunzio J. Palladino, Chairman, NRC, Before the Senate Committee on Energy and Natural Resources, page 7 (September 12, 1985).

As repository licensing falls directly on the "critical path", it is incumbent for DOE to coordinate closely with the NRC in developing a licensing strategy flexible enough to achieve the statutorily mandated schedules. We are concerned that DOE's failure to establish an appropriately staffed licensing office thus far may reflect its inexperience in such complex proceedings. The licensing proceedings are certain to be vigorously contested and the NRC should not rigidly adopt the same inefficient procedures that have been used in the licensing of nuclear power plants.

It is our firmly held opinion that specific licensing reforms must be adopted if program schedules are to be met. We urge this Committee, DOE and NRC to consider carefully the following recommendations for license reform:

- Close coordination and cooperation between DOE and NRC must begin early in the site characterization and facility design phases to resolve licensing issues during the pre-application period and to expedite subsequent formal licensing review. Congress contemplated this type of early and intense cooperation of the two agencies when establishing the explicit deadline for licensing.
- Licensing issues, both procedural and substantive, must be identified and resolved to the maximum extent possible during the site characterization phase prior to filing an application for construction authorization. The NRC should be working to develop appropriate Branch Technical Positions, Regulatory Guides and Topical Reports to establish, in advance, engineering designs that meet regulatory criteria and are acceptable to the NRC Staff. The NRC should also aggressively

use its rulemaking authority to resolve -- with full public participation -- as many technical issues as possible prior to public hearings.

- The NRC must develop and establish procedures to streamline the post-application review process as well. It may be possible and desirable to have surface waste handling facilities and a standard waste package licensed in advance of licensing proceedings for the underground geologic repository itself.
- The public hearing process must be streamlined. We suggest the early establishment of a public document room in the vicinity of each characterized site as an alternative to traditional discovery, and revision of the threshold for admissibility of contentions to ensure only genuine issues in dispute are litigated. The NRC hearing process for nuclear reactors has become unwieldy, time-consuming and unsatisfactory to all parties. It should not be slavishly followed.
- Consideration should be given to issuing a preliminary license for "low-power" operation and disposal, based on a conservative low heat loading on the geologic media through a wider spacing of the waste canisters and disposal only of the oldest fuel. Such a preliminary license would allow for the generation of data that would permit issuance of a final operating license for higher heat loading with a greater degree of certainty.

This is by no means an exhaustive list. Many other licensing reforms may be worth considering.

Transportation Issue Raised by S.1162

S.1162, introduced by Senator Hart on May 16, 1985, would amend Section 114 of the Nuclear Waste Policy Act to require that DOE's site recommendation be based, in part, on the effect of high-level waste transportation on States having possible transportation routes, particularly States adjacent to a State recommended for a repository. DOE would be required to include in its site recommendation such factors as the likely routes within each State, the condition of such routes and cost of necessary upgrading, and the significant human activities and population densities along the route. The bill would also require DOE to provide financial assistance to the States for infrastructure improvements. We believe that amending the Act in this fashion is both unnecessary and inappropriate.

First, DOE has promulgated a separate, comprehensive transportation guideline that requires the evaluation of such factors as a site's proximity to adequate highways and railroads, the condition of access routes from existing highways and railroads to the site, the costs and other impacts of designing and constructing the access routes, the impacts of transporting waste over the access routes, the relative costs and risks of transportation to the various sites, the proximity of access routes to local cities and towns, and the adequacy of emergency response preparedness in the affected State. DOE's transportation guidelines already require consideration of many of the factors mentioned in S.1162 in evaluating and ranking potential repository sites. The guideline accords appropriate weight to the potential risks of transportation in the overall process of siting a repository.

Secondly, each of the nine draft environmental assessments issued by DOE in December 1984 contains a detailed discussion of the relevant transportation factors identified in the transportation guideline. In response to comments, including those filed by the Electric Utility Companies' Nuclear Transportation Group, DOE is expected to provide in the final environmental assessments even more detail on potential transportation impacts in the various States affected by transportation of spent fuel to the repositories.

Third, in September 1985 DOE issued for public comment a draft Transportation Institutional Plan, the purpose of which is to lay the foundation for interaction between the DOE and such diverse groups as States and local governments, tribal governments, intergovernmental organizations, utilities, private industry, and the public. DOE has indicated in its draft Transportation Institutional Plan that it will conduct route-specific evaluations of the potential costs and risks of transport during the development of an environmental impact statement (EIS) for the site selected for a repository.

Fourth, prior to development of the EIS, the affected governmental entities and the public will be provided the opportunity to provide input to DOE's consideration of route-specific impacts, through comment on the draft Transportation Institutional Plan and participation in Transportation Institutional Plan workshops sponsored by DOE. DOE has also indicated that it is developing guidelines to specify the availability and appropriate use of financial assistance to affected governmental entities for such activities as emergency response training, inspection and enforcement activities, infrastructure improvements, and routing analyses.

Independent Review of DOE's Repository Site Evaluation Methodology

The National Academy of Science's Board on Radioactive Waste Management has recently completed an independent review of the methodology used to evaluate sites as candidates for characterization for the first geologic repository. The Board commended DOE for its adoption of a "rigorous" form of decision-aiding methodology. While the Board did not review application of the methodology to the site ranking process, its opinion was that the multiattribute utility technique utilized by DOE can be an appropriate method by which to integrate technical, economic, environmental, socioeconomic, and health and safety issues to assist DOE in its selection of sites for characterization.

The Board had earlier criticized DOE for treating post-closure factors independently and assigning each factor equal weight. The Board suggested that a scientifically defensible method of integrating and weighting the post-closure factors at each site would be to conduct a "performance assessment" using quantitative models. While acknowledging that adequate data and valid models are not yet available to perform rigorous performance assessments, the Board offered that expert judgment could be used to develop subjective estimates of the performance of the post-closure factors at each site. We emphasize this Board finding because EEI and the UNWMG, in commenting on the Environmental Assessments, evaluated DOE's site ranking methodology utilizing recognized experts from The Analytical Science Corporation (TASC). TASC extrapolated system performance using post-closure guidelines for each of the five sites and exercised judgment to project isolation capability. TASC found, using a methodology now endorsed by the Board, that all five candidate sites are technically acceptable and not clearly distinguishable on the basis of post-closure guidelines alone.

The Board voiced concern about DOE technical experts assessing system performance and recommended that an independent panel of outside experts review the complete analysis prior to issuance of the final Environmental Assessments. However, DOE's ongoing decision process has been and continues to be subject to outside, independent peer review. Additionally, independent review could well delay the issuance of the Environmental Assessments and the nomination of sites for characterization. We do not believe further delay in issuance of the Environmental Assessments is warranted.

Environmental Protection Agency Standards

In August 1985 the Environmental Protection Agency adopted its standards governing high-level waste disposal. These standards impose extremely strict limits. In fact, they are thousands of times more stringent than those applied in other areas subject to EPA jurisdiction. In addition, the standards require the use of quantitative probabilistic analysis in applying the limits. We are concerned that these aspects of the EPA standards will result in unnecessary obstacles to the licensing of a high-level waste repository, with minimal -- if any -- benefit to the public.

Our concerns in this regard are shared by the NRC's Advisory Committee on Reactor Safeguards. In a recent letter to the Commission, the ACRS stated, in part:

> It is our understanding that the NRC Staff has concurred with the proposed EPA standards, including the use of a probabilistic approach on radionuclide release limits. In view of the importance of the ability of the NRC to determine compliance with the EPA standards in licensing a high-level waste repository, we recommend that the Commission assure itself that the NRC Staff is correct in endorsing this approach. We believe that demonstration of such compliance will be extremely difficult and that the proposed standards are unduly restrictive. (emphasis added).

Since that letter was written the ACRS has met with the Commission to consider this matter further, but it remains unresolved. We believe the issue is potentially serious, however, and one concerning which the Committee will want to remain apprised.

Conclusion

Congressional oversight of DOE's Nuclear Waste Program will help to assure that the program is implemented in a safe, environmentally sound, timely, and cost-effective manner. We appreciate the opportunity to appear before this Committee and would be pleased to answer any questions you may have.

Attachment A to EEI, ANEC, UNWMG, NTG Statement
by Wallace B. Behnke

THE EVALUATION OF NUCLEAR WASTE REPOSITORY PROGRAM COST SHARING BETWEEN CIVILIAN AND DEFENSE WASTES

The purpose of this document is to summarize an approach to the sharing of those parts of repository program costs which are common to civilian and defense wastes and to illustrate the application of this approach using preliminary but reasonable cost and waste data.

BACKGROUND

On April 30, 1985, a formal decision was made by President Reagan to dispose of defense high level waste in repositories that include civilian (spent fuel) wastes rather than in a separate NRC-licensed repository dedicated solely to defense waste disposal. One of the principal reasons favoring this decision is that defense and civilian wastes can be emplaced for disposal in combined repositories at considerable savings relative to emplacement in separate repositories(1). An acceptable methodology for the equitable sharing of costs will have to be established. This methodology should become a part of DOE's established annual disposal fee evaluation process, and will have to be usable over an extended period. It is therefore important that it be based on sound principles of equity in cost sharing and the consistent application of appropriate methodology.

Costs which are unique to either Defense Waste or Civilian Waste, such as waste-specific transport or storage costs, would not be shared, but would be paid wholly by the Defense or Civilian programs, as appropriate. The remainder of this document provides:

1. A suggested set of basic principles for defining "equivalence" in cost sharing.

2. A suggested method for establishing the amounts and characteristics of actual and projected wastes for disposal.

3. An outline of the minimum capability of a costing methodology that will be consistently used to evaluate the long-term costs of separate and combined disposal programs.

4. A suggested cost sharing basis in which the above equity principles, projected waste loads and costing methdologies are applied to the determination of the fraction of costs to be borne by the defense and commercial sectors, and the timing of fee payments.

The document concludes with an illustrative estimate of cost sharing which is based on application of the basic equity principles to preliminary data on waste amounts, costs and the suggested cost-sharing and fee timing methodologies.

1. EQUIVALENCE IN COST SHARING

The NWPA, Section 302(b)[4], establishes the requirement that Defense Programs pay "for deposit in the Nuclear Waste Fund, amounts equivalent to the fees" paid by the utilities. DOE's regulations establishing terms and conditions under which waste disposal services are to be provided mandate that "fees to be paid by Federal agencies will be equivalent to the fees that would be paid under the contract" 10 CFR 961.5. "Equivalence" would include the following basic characteristics of the present utility fee structure.

1. The fees are based on actual past and evaluated future program costs and the proportional sharing of total program costs (as distinguished from just the cost increments due to Defense wastes) among all prospective repository users.

2. For wastes generated prior to April 1983, an appropriate one-time payment is due in June 1985. One-time payments made thereafter accrue interest from April 1983.

3. For wastes generated after April 1983, quarterly fees are due as the fission products are generated in reactors.

4. To the extent that the total of anticipated fees exceeds evaluated costs by some ratio, both Civilian and Defense fees should include that same margin ratio.

2. AMOUNTS AND CHARACTERISTICS OF WASTES

The physical numbers, size and thermal output of the basic waste disposal units that will be received by the repository and the corresponding times of origin of the fission products that ultimately become wastes going into the disposal units is a necessary part of any total cost evaluation, and must therefore be developed. However, it is believed that another basic principle should be established: that the numbers and characteristics of waste units will be based on the actual current amounts plus the best current estimate of projected operations of waste-producing facilities that are actually in current operation, or committed and in construction, and will not include the projected operation of projected power or production facilities. This will mean that estimates of utility spent fuel output will be based on the EIA "No new orders" case, rather than the current "Mid Case" of nuclear growth which includes the projected fuel output of projected reactors. It would also mean that the defense waste from projected new Defense production facilities will not be included. It would include current and projected wastes from the existing Savannah River, Hanford and Idaho facilities except those for which repository disposal is not indicated. The basis for this suggestion is that there is already a more-than-adequate lead time for planning the disposal of wastes when a new waste-generating facility is committed. Because there is already significant uncertainty dealing with the projected output of committed facilities, it is both unnecessary and possibly contentious to add the double uncertainty of the projected output from projected facilities. The very sound practice of periodic reviews of fee adequacy provides automatically for the future inclusion of new facilities at the time they are firmly committed. At that time, appropriate adjustment of fees and cost sharing would occur.

3. REPOSITORY PROGRAM COST MODEL

It is necessary to establish an acceptable reference waste disposal program and a related facility design and cost model that can realistically represent the timing and amounts of all relevant R&D costs, and facility capital, operating, and decommissioning costs. This program cost model should be sufficiently detailed that it can realistically represent total costs and cost differences in repository programs and facilities involving (i) only defense wastes, (ii) only commercial wastes, and (iii) both defense and commercial wastes. The reference waste disposal program and cost model should be similar to those currently in use by DOE in fee adequacy studies. It is essential that the same cost model be used for each system. This will assure that common design assumptions and common cost data are utilized. In this way the resulting cost differences reflect physical differences between systems, and are not due to differences in basic assumptions or data. Although the commercial and defense programs will each have non-repository program components, facilities and related costs which are solely specific to their respective wastes, the cost analyses done for cost sharing purposes should not include these. In general the cost-sharing analysis would include only the generic part of the current program development and evaluation (D&E) costs and the repository costs, and would exclude non-repository waste-specific costs such as spent fuel or defense waste transport. It would also exclude interim storage costs such as spent fuel storage R&D, MRS program costs or Defense R&D and DWPF storage costs, except where storage facilities are shared to reduce overall costs.

However, the commercial repository program requires two repositories whose operations are expected to be coordinated. The addition of defense wastes, even if limited to one of the two repositories, will affect both repositories. Furthermore, the annual fee evaluations must be based on two repositories. It is therefore desirable that cost sharing be based on a cost analysis that includes both repositories. It is also important that the evaluations recognize the probable continuation of disposal operations past the year 2020, based on wastes that originate through the year 2020, and include these in the overall cost evaluations. The year 2020 is picked to be consistent with the established disposal fee evaluation process.

4. THE BASIS FOR COST SHARING AND FEE DETERMINATION

The projected waste loads, and the repository program cost model are used to provide consistently-developed costs for repository programs involving:

1) Only defense wastes (a single repository)
2) Only civilian wastes (two repositories)
3) Combined defense and civilian wastes (two repositories)

It is expected that the unit costs of disposal will be the lowest in the combined-repository situation. The basic question, which is also the principal concern of this document, is "How are the total costs of the combined defense-commercial repository program to be shared between the defense and civilian sectors?"

There are a number of physical characteristics of the wastes which have an influence on waste disposal costs, and which could be proposed as a basis for cost sharing. Such possible cost sharing options include:

1) Costs shared in proportion to radioactivity (curies) at generation or at emplacement.
2) Costs shared in proportion to thermal output at generation or at emplacement.
3) Costs shared in proportion to volume of wastes or volume of excavation.
4) Costs shared on the basis of numbers of disposal packages.

Actual disposal costs depend moderately on thermal output at emplacement and on the numbers of disposal packages, and depend somewhat on the volume of wastes and on the radioactivity. However, significant portions of repository costs, such as the Development and Evaluation costs are essentially independent of waste characteristics. For single waste types such as spent fuel, which have the same basic form, and which cool for similar periods, energy production is a simple and reasonable basis for allocating costs among generators of that single waste type, and that is the basis for the 1 mill/kwh disposal charge for spent fuel. However, when wastes such as defense and civilian wastes differ markedly as to waste form and cooling period, no single physical measure can be expected to represent cost dependence with sufficient accuracy for cost sharing. Therefore, the most reasonable measure for cost sharing appears to be the costs, themselves. Furthermore, the basic methodology for cost-based cost sharing between defense and civilian wastes is already in place by virtue of the established methodologies and data for the periodic evaluation of civilian waste fee adequacy. Specifically, the evaluated costs of separate and combined repository programs can provide an equitable basis for cost sharing, as follows:

> Each sector (defense and civilian) is to pay a fraction of the combined-repository-program costs which is the same as that sector's fraction of the sum of the evaluated costs for separated repository programs.

The above cost sharing basis has the inherent characteristic that the cost savings resulting from combined operations are shared in proportion to cost obligations. This characteristic appears to be a central requirement for the equitable treatment of both sectors. In addition, this cost sharing basis has the advantages of being relatively simple in concept and of avoiding the potentially-contentious need to attempt assigning costs to each sector in a combined repository program. The costs themselves are used to make the basic cost sharing assignment. This will focus the attention of the cost evaluators on the fundamental issues of comparable and consistent system representation and design, cost methodology, cost data bases, and financial assumptions, including the effective discount rate.

Once the total combined-system costs and the portions to be borne by each sector have been determined, the amount and timing of fees can also be determined. This is done by allocating the costs within each sector on a per-unit basis which is related to when the fission products are generated. The commercial sector is already using energy generation as the fee basis (1 mill/kwhe). Because of security reasons, allocation on the basis of direct energy output may not be acceptablefor defense wastes , but some reasonable basis could be used such as "per equivalent waste package" if this were closely related to when the "equivalent waste packages" (i.e., fission products) were generated.

Since the commercial-sector fees are already established, the defense-sector fees are to be determined on a comparable basis. Using the pre-April/83 number of waste units and the subsequent annual units, the amount of the defense waste one-time and annual cost obligations can be determined. The defense cost obligations are then translated into fee obligations by adding the same percentage margin that the current 1 mill/kwhe commercial waste fee represents over the newly-evaluated unit costs for the commercial sector.

5. ILLUSTRATIVE EXAMPLE OF DEFENSE WASTE COST SHARING

The approach described above is demonstrated in this section. The purpose of this example is two-fold: to illustrate the suggested method with reasonable numbers; and to indicate the general nature of the results.

With respect to waste amounts, defense waste deliveries are as stated in the Defense Waste Management Plan, DOE/DP-0015(2), totalling 19,200 packages through the year 2020, plus an additional 5 years assumed to be at 650 packages/year so as to include disposal of all waste from the reprocessing of defense production fuels discharged through 2020 assuming 5-year cooling, consistent with the same assumption for civilian spent fuel.

The commercial wastes (spent fuel) are based on the EIA's no-new-order case with increasing burnup(3), totalling 80,700 MTU discharged through 2020. At an average disposal package loading of 6 PWR/18 BWR assemblies the number of commercial packages is estimated to be about 27,600. The assumed repository disposal rates for these packages are summarized in Table 1. The assumed operating periods of the commercial and combined repositories are shorter, and the disposal rate capacity of the second repository is less than for DOE

TABLE 1

ASSUMED REPOSITORY DISPOSAL RATES

		Operating Period			
		1998-2007 (10)	2008-20 (13)	2021-25 (5)	Totals
A. Separated					
Defense, Pkgs/yr		620	1,000	650	22,450 pkg.*
Civilian 1	MTU/yr	3,000	1,500	-	49,500 MTU
	Pkgs/yr	1,027	515	-	16,965 pkg
Civilian 2	MTU/yr	-	1,825	1,500	31,200 MTU
	Pkgs/yr	-	625	515	10,700 pkg
B. Combined					
Repo 1,	MTU/yr	3,000	1,500	-	49,500 MTU
Civilian	Pkgs/yr	1,027	515	-	16,965 pkg
Defense	Pkgs/yr	620	1,000	-	19,200 pkg
Total	Pkgs/yr	1,647	1,515	-	36,165 pkg
Repo 2,	MTU/yr	-	1,825	1,500	31,200 MTU
Civilian	Pkgs/yr	-	625	515	10,700 pkg
Defense	Pkgs/yr	-	-	650	3,250 pkg
Total	Pkgs/yr	-	625	1,165	13,950 pkg

* This total is the 19,200 packages available for disposal, plus 650 pkgs/yr for 5 years, based on defense production fuel discharges and 5-year minimum cooling, consistent with civilian fuel discharges through 2020.

evaluations, such as the Mission Plan(4) or the Fee Adequacy Assessment(5), because the amounts of spent fuel are less, consistent with the assumption that only the wastes from committed waste generation facilities are to be included. With a separate defense repository, a 28-year operating period is required. The first commercial repository is assumed to operate 10 years alone, plus 13 years overlapping with the second repository. The second commercial repository is assumed to operate alone for 5 years after 2020. In the combined repositories, the defense wastes go solely to the first repository during its operating period, and thereafter to the second repository.

It should be noted that the above evaluation includes two civilian repositories, instead of the single civilian repository assumed in the cost studies performed by Defense Programs(1). The fundamental reason for using two civilian repositories in the cost sharing analysis is that it appears undesirable to restrict defense wastes to a single repository in the absence of analyses which define the best operating mode for a two-repository system. For example, transportation impacts and costs are clearly reduced if DWPF wastes were to be shipped to the second repository presumably located in the eastern U.S. once that repository were opened. Basic system operating strategy probably requires that both repositories be capable of disposing of both defense and civilian wastes, as backup in the event of difficulties at either repository, and in anticipation of filling and closing the first repository. The fee evaluation process is already established as a two-repository evaluation and this should continue when defense wastes are added to the system. For these reasons, it is suggested that a two-repository system, including defense wastes, be the basis for the cost-sharing evaluation.

The waste package characteristics which have the strongest impact on costs are summarized in Table 2. The defense waste package has a slightly larger diameter than the commercial package and therefore costs somewhat more. However, the defense waste package has only 1/6 of the thermal output of the commercial package and is only 77% of its length. Because of this, it requires only 1/6 of the underground area and 1/8 of the placement corridor mining compared to the commercial wastes. Further, because of this reduction, the defense repository may be operable with fewer deep shafts (4 per repository vs. 5 for the commercial repository). These principal differences are reflected in the costs.

TABLE 2
ASSUMED WASTE PACKAGE CHARACTERISTICS

	Defense Package	Commercial Package
Contents:	DHLW	6 PWR/18 Bwr (2.92 MTU/pkg)
Thermal Output, Watts	500	3,000
Waste Overpack ID	61 cm	45 cm (consolidated)
Waste Canister Height	10 ft.	13 ft.
Waste Overpack Cost (1983)	$40,800	$26,100
Total No. of Packages	22,450	29,550

The cost methodology used for this preliminary assessment is based on the methodology used in the WADCOM (WAste Disposal COst Model) computer program(6). It represents the principal dependences of repository capital and operating costs on repository capacity, and on waste package characteristics, principally package size and thermal output. The overall costs are normalized to the bedded salt costs in 1983 dollars from Table 10-6 of DOE's Draft Mission Plan(4) and increased by 19% to be consistent in aggregate with the first salt repository (1984) costs in Table 1 of the Fee Adequacy Assessment(5). The latter costs are generally consistent with the aggregate costs in Table 10-9 of the Final Mission Plan(4). The resulting cost model is believed to provide a reasonable representation of repository costs and cost differences that are related to variations in repository capacity and waste package characteristics. The results will be internally consistent in the sense that basic assumptions and cost data are common to all cases, and the cost differences that are generated will be due to identifiable physical differences between systems.

The cost analyses were performed on three systems:

1) A defense-only repository

2) Two commercial-only repositories

3) Two combined defense-commercial repositories

The repositories which include commercial waste perform the fuel consolidation function in repository surface facilities. The defense-only repository does not need this function and saves the associated capital and operating costs. In the combined repositories, cask handling and waste package handling and disposal facilities are larger to accommodate the added requirement due to defense wastes. The same amounts of waste disposal are assumed to occur each year in both the separate and combined systems. In addition, development and evaluation (D&E) costs for the first and second repositories are included, and are taken from Table 1 of the Fee Adequacy Analysis(5). The total of $7.5 billion is assumed to be divided into $4.0 billion for the first, and $3.5 billion for the second civilian repositories.

With respect to the D&E costs, there is some debate as to the extent to which a Defense waste-repository has to undertake the full and complete NWPA-specified process of site nomination, recommendation and final selection, and the related extensive public participation process. However, a Defense repository must be licensed by the NRC and this involves the extensive characterization of three sites, plus the public participation that is inherent in the NRC licensing process. It is virtually impossible to predict the net Defense D&E cost savings that would arise from the procedural differences between the Defense and Commercial siting and licensing process. However, because of the nature of the NRC licensing process, including its established and well utilized provisions for public participation, the Defense and Commercial D&E costs for the Defense and first Civilian repositories are judged to be essentially identical at $4.0 billion.

The cost results are summarized as follows:

	Total Costs, $-million (1984)					
	Waste Pkg	Disposal	Subtotal	D&E	Total	%
Defense-only	1,410	2,940	4,350	4,000	8,350	32
Commercial 1	1,600	4,100	5,700	7,500	17,700	68
Commercial 2	1,150	3,350	4,500			
Totals			14,550		26,050	100
Combined 1	2,640	4,950	7,590	7,500	20,000	
Combined 2	1,350	3,560	4,910			
Totals			12,500		20,000	
% Saving over Separate Repositories:			14%		23%	

The basic conclusions of the above are 1) that both the Defense and Civilian programs will save over 20% of common costs by combining repository operations, and 2) that the defense repository costs would be approximately one-third of the shared portion of the combined repositories program costs.

It is worthwhile to understand the basic reasons for the general level of defense waste disposal costs relative to commercial costs. In this regard, it has been noted (1) that defense wastes have only 15% of current total radioactivity and this level will be down to 3% by the year 2000. Considered in isolation, these facts can create the impression that defense waste disposal costs should be small, relative to commercial costs. On the other hand, the waste forms are significantly different and this is quantified by the more than 22,000 large defense waste packages as compared to the less than 28,000 smaller commercial waste packages anticipated to originate through 2020. By this particular measure, defense wastes are 45% of total wastes. The key point is that it is costs that are being shared and particular physical characteristics are important to cost sharing only to the extent that they influence costs. The basic reasons that the single Defense repository program has evaluated costs that are about one-third of total separate-repository program costs are 1) the Development and Evaluation (D&E) cost is about $4 billion per repository and is essentially independent of waste characteristics, 2) the large number of defense waste packages which offset the real cost savings from the lower thermal output of defense wastes, and 3) the significant level of fixed repository capital and operating costs such as surface facilities, shafts, underground development and ventilation, that are largely independent of waste characteristics and amounts. In summary, the principal source of the savings from a combined Defense-Civilian, 2-repository program as compared to a separated 3-repository program is the avoidance of D&E costs for 1 repository, amounting to about $4 billion, plus the avoidance of fixed facility costs, amounting to an additional $2 billion.

Once the costs of the combined repository program are evaluated, and the defense portion allocated, the amount and timing of defense waste fees can be determined. First, the margin ratio of current Commercial fees over current Commercial costs must be evaluated. This margin ratio of fees-to-evaluated-costs applies to both repository and non-repository costs in the Commercial program but it applies equally to all costs. It is therefore appropriate and equitable to apply this same ratio to evaluated Defense costs in order to determine Defense waste fees. Continuing to use the above example for illustration, the Commercial portion of the combined repository program costs is 68% of $20 billion, or $13.6 billion. To this must be added other program costs which are specific to Commercial wastes, such as spent fuel transport, and spent fuel storage R&D. If these added costs were $5.2 billion, the total evaluated cost would be $18.8 billion. The fee margin is determined by ratioing expected commercial fee revenue at 1 mill/kwh to this total evaluated cost. The EIA No-New-Orders Reference case, on which the spent fuel output estimates are based, shows a revenue of about $22.5 billion. This is then ratioed over the total evaluated commercial program cost to determine the overall fee margin, 1.2 in this example. This same margin would be applied to the defense waste costs, as follows: Evaluated defense costs are 32% of $20 billion or $6.4 billion. Applying the 1.2 fee margin to this yields $7.7 billion as the defense fee base. If this is allocated on a per-package basis, the average per-package cost is about $345,000 over 22,450 waste packages. Assuming, hypothetically, that the pre-1983 waste inventory of Savannah River, Hanford and Idaho wastes is the equivalent of 5000 packages, and the wastes which will make up the remaining 17,450 packages are being produced over the remaining 38 years through 2020 at an average rate of 460 packages/yr, an immediate one-time payment of $1.7 billion and an annual average payment of $158 million would be indicated for defense wastes. It should be noted that although the fee margin ratio is sensitive to the particular waste management and cost scenario chosen for the evaluation, when it is used with an already-fixed Commercial unit fee to develop the Defense fee, the latter is not particularly sensitive to the cost evaluation scenario. In fact, to the extent that defense and commercial costs and waste amounts maintain relative relationships across various scenarios, the per-unit defense waste fee is insensitive to the evaluation scenario. It is therefore desirable to select one or more reasonable scenarios for evaluation of an equitable defense fee, but it is not anticipated that the defense fee will be significantly influenced thereby. The two most sensitive factors to the results of the evaluation appear to be 1) the relative amounts and characteristics of the two wastes, and 2) the costs of those parts of the repository where waste amounts and characteristics have the largest influence on costs.

CONCLUSIONS AND RECOMMENDATIONS

The principal conclusions and recommendations of this document are:

1. Equivalence in the sharing of costs of nuclear waste disposal between the Defense and Civilian sectors should require that both sectors pay fees based on the same principles that have already been established and implemented for the Civilian sector.

2. The evaluated costs of separated and combined repository programs provide a sound basis for determining and sharing the cost savings that will result from combined repositories. It is recommended that the fraction of combined-program costs borne by each sector be proportioned to the evaluated costs of separate repository programs. This results in sharing the cost savings in proportion to cost obligations.

3. An illustrative example of Defense waste cost sharing has been provided herein, based on waste and cost data that are believed to be reasonable. This preliminary analysis indicates that the appropriate level of Defense waste cost sharing is in the range of one-third of combined-repository program costs. It is the principal recommendation of this document that the level of Defense waste cost sharing be established with greater rigor and precision than was appropriate for this preliminary scoping document.

REFERENCES

(1) U.S. Department of Energy, "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High Level Waste", (Draft), DOE/DP-0020, July 1984; (Final) DOE/DP-0020/1, June 1985

(2) U.S. Department of Energy, "The Defense Waste Management Plan", DOE/DP-0015, June 1983

(3) U.S. Department of Energy, Energy Information Administration, "Projections of U.S. Nuclear Power Plant Capacity, Generation, and Spent Fuel Discharges, 1984-2020", SR-NAFD-84-01, March 1984

(4) U.S. Department of Energy, "Mission Plan for the Civilian Radioactive Waste Management Program", (Draft), DOE/RW-0005, April 1984; (Final) June 1985

(5) U.S. Department of Energy, "Nuclear Waste Fund Fee Adequacy: An Assessment", DOE/RW-0020, February 1985

(6) Battelle Memorial Institute, "WADCOM: A Waste Disposal Cost Model", ONI-6, June 1983.

Attachment B to EEI, ANEC, UNWMG, NTG Statement
by Wallace B. Behnke

INTERPRETATION OF SECTION 114(f) OF THE NUCLEAR WASTE POLICY ACT

Section 114(f) of the Nuclear Waste Policy Act ("NWPA") details compliance with the National Environmental Policy Act of 1969 ("NEPA") in selecting the first geologic repository for waste disposal, and provides in pertinent part:

> For purposes of complying with the requirements of the National Environmental Policy Act of 1969 (42 U.S.C. 1321 et seq.) and this section, the Secretary [of Energy] shall consider as alternate sites for the first repository to be developed under this subtitle 3 candidate sites with respect to which (1) site characterization has been completed under Section 113; and (2) the Secretary has made a preliminary determination that such sites are suitable for development as repositories consistent with the guidelines promulgated under Section 112(a).

Comments on the Mission Plan elicited conflicting views on the timing of the "preliminary determination" of site suitability. DOE has interpreted the NWPA to allow the "preliminary determination" to be made at the time the Secretary recommends three sites to the President for site characterization. See Mission Plan, Volume II, § 5.4.1 at 138-40.

In their comments on the Mission Plan, the NRC, certain States and environmental groups argued that three sites must receive a "preliminary determination" of suitability after site characterization activities are completed. While the language of this section and the legislative history surrounding the inclusion of the language at issue in the Act are not without some ambiguity, DOE's interpretation is the only one consistent with the purpose, structure and mandate of the Act.

The position taken by the NRC, et al., would require a finding of site suitability at the end of the site characterization process. Such an interpretation would be an odd time for a preliminary determination (since DOE will then have all of the information available to make its final determination) and it would necessarily require that three sites survive characterization. DOE notes that such an interpretation means either characterizing more than three sites or accepting the risk of large schedule and cost uncertainties should one of the initial three sites be found unsuitable. For this reason it is inconsistent with the Act.

Section 112(b)(1) of the Act directs the Secretary to "nominate at least 5 sites" and "recommend to the President 3 of the nominated sites" for site characterization. The Act does not permit characterization of more than three sites (otherwise the Act would have directed the Secretary to recommend at least three sites for characterization). The NWPA does not contemplate, nor would the mandated schedule for repository initial operations permit, the possibility of delay while characterizing a fourth or fifth site, should one or more of the three sites be found unsuitable after characterization was completed.

One of the principal amendments in the Senate version of the House-passed bill was in changing the site selection process. The House bill was to have the Secretary recommend to the President at least five sites by July, 1984 and one additional site by February 1, 1985 for site characterization. From these six (or more) sites at least three would be characterized. The Senate bill provided that at least five sites would be nominated, but only three would be recommended for characterization and one would be selected for the first repository.[1/]

While the language of the Act is complex and not without some ambiguity, the answer to this important question of interpretation, in the context of the site selection process, is compellingly clear. Senator Simpson asked for clarification of the repository site selection procedure during final Senate debate as reflected in the following brief excerpt from a colloquy with Senator Johnston.[2/]

> MR. SIMPSON. . . . .
>
> Of the five sites nominated in the first round, three will be recommended for characterization, and one of these three will be selected as the first repository.
>
> . . . .
>
> MR. JOHNSTON. The Senator is correct.

[1/] *See* 128 Cong. Rec. S 15641 (daily ed. Dec. 20, 1982).

[2/] 128 Cong. Rec. S 15660-61 (daily ed. Dec. 20, 1982).

Senator Johnston, one of the floor managers of the NWPA, did not in any way qualify his answer. He did not say that one of the three would be selected only if all three sites recommended for characterization were subsequently found "suitable". It was without doubt, the intent of Congress that one of the three initially characterized sites "will be selected as the first repository".

DOE's interpretation is the only one consistent with the Congressional mandate to implement the NWPA on the schedule established by law. An essential and virtually unprecedented aspect of the NWPA was the detailed schedules or deadlines mandated by the Congress for accomplishment of the requirements of the Act by the federal agencies, including a "roadmap" interpreting the requirements of NEPA compliance. The Senate Committees carefully considered the testimony of witnesses from DOE, NRC, other federal agencies and interested parties before reporting S. 1662. Based on such testimony, the schedules originally established in draft bills were adjusted to provide three additional years to be allocated to site identification, site characterization and selection, and to NRC's review and approval of the application to build the first repository. The Senate Committees determined the schedule to be "realistic and workable" and expected "the involved agencies to do everything possible to assure that [the] schedule is met."3/ Indeed the

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3/ S. Rep. No. 282, 97th Cong., 1st Sess. 21 (1981).

deadlines were extended even further after careful consideration by the House Committees and reconsideration by the Senate. The schedule could not accommodate the potential delay of characterizing a fourth or fifth site, if one or more of the three sites initially characterized were found unsuitable.

Unfortunately, there is little formal legislative history on the final version of the NWPA. Differences in the Senate-passed version of the NWPA (S. 1662) and in the House-passed version (H.R. 3809) were not resolved in a Conference Committee. Instead, the principal supporters of the bills in both Houses of Congress met informally to agree on certain amendments to a McClure substitute to the House-passed bill. The Senate then passed the McClure substitute to H.R. 3809, as amended, by voice vote. On the same day, the House agreed to the Senate's version of H.R. 3809.

As it turns out, Section 114(f) was the subject of two of seventeen negotiated amendments to the McClure substitute. The language which appears in the enacted version of the NWPA was drafted by the *ad hoc* Senate-House negotiators. Senator McClure described the Amendments to Section 114(f) during the final Senate debate as follows:[4]

> Mr. President, these two amendments are of a clarifying nature, to make it clear that the Secretary's preliminary determination that sites are suitable for development as repositories is to be made consistent with the Secretary's guidelines promulgated

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[4] 128 Cong. Rec. at S 15642 (daily ed. Dec. 20, 1982).

> under Section 112(a). Without reference to the 112(a) guidelines, it was not clear what criteria the Secretary was to use in making this preliminary determination, and this amendment is intended to clarify that oversight.

The amendment to Section 114(f) reflected compromise. Senator McClure wanted to avoid any possibility that the EIS to accompany the recommendation of the site for the first repository might be embroiled in litigation regarding the adequacy of the "preliminary determination" of suitability of alternate sites. The Senators and Representatives were also mindful of the need to avoid major amendments to the House-passed version in the sensitive area of NEPA compliance, to avoid last minute controversy that could result in adjournment without final passage of the Act. The compromise was to clarify the criteria for making the "preliminary determination" of the suitability of the alternate sites by reference to the guidelines promulgated under Section 112(a) for recommendation of candidate sites for site characterization in the first place. Senator McClure notes that this amendment was also meant "to clarify that the Secretary's 'preliminary determination' is to be made at that point in time when the guidelines are applied 'in considering candidate sites for recommendation'." This occurs "when the Secretary recommends three of the candidate sites to the President for characterization (i.e., prior to site characterization."[5/]

[5/] Letter to Honorable John Herrington from Senators McClure, Domenici, Simpson and Johnston dated June 25, 1985.

In a letter from Congressmen Dingell, Markey, Swift and Wyden providing their understanding of the legislative history of Section 114(f), a statement by Representative Ottinger is cited, which offers his opinion that the preliminary determination would occur late in the site characterization program.[6] This statement occurred December 2, 1982, prior to the Senate amendments to the site selection process. The concern addressed by Representative Ottinger was one expressed by the States that the site selection process would "be a stacked deck for or against a particular site."[7] This concern was addressed in part by the Senate amendment which required that the preliminary determination be made on the basis of the Site Selection Guidelines to preclude consideration of a bogus site. In any event, what was "envisioned" by Representative Ottinger is not a binding interpretation of the bill -- even in the form as passed by the House.

Congressman Udall points to his statement in the December 20, 1982 Congressional Record (H. 10523) for support of his interpretation of when a preliminary determination of suitability must be made.[8] It appears that Mr. Udall's understanding of the changes to the bill as a result of amendments in the Senate

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6/ Letter from Congressmen Dingell, Markey, Swift and Wyden to Mr. Ben Rusche dated July 26, 1985.

7/ 128 Cong. Rec. H. 8797 (daily ed. Dec. 2, 1982).

8/ Letter from Congressman Udall to Mr. Benard Rusche dated July 26, 1985.

differs from Senator McClure's understanding. Senator McClure was, of course, the author and proponent of the amendments and the McClure substitute to H.R. 3809 that was passed by the Senate and the House on December 20, 1985. This difference of opinion by two of the principal sponsors of waste legislation underscores the complexity of the statute, the uncertainty of legislative history and the need to analyze the Act in the context of the overall program enacted by Congress. As noted above, such an analysis leads inexorably to the interpretation given by DOE in the Mission Plan.

The language of the NWPA and the legislative history as reflected in the floor statements on the day of its passage, support DOE's position that the President's recommendation to the Congress of the site for the first repository will be selected from the initial three sites characterized, and the EIS need only consider such sites as alternates. Thus, the preliminary determination of site suitability can logically be made only prior to site characterization. Furthermore, an interpretation to the contrary could not be sustained because it could (if one of the characterized sites were found "unsuitable" after three years of characterization activities) needlessly abort the deadlines established by the NWPA. The federal agencies tasked with implementation of the NWPA cannot ignore that statutory mandate.

Finally, DOE's interpretation of its obligations under the NWPA is to be given great weight. General Electric Uranium Management Corporation v. DOE, 764 F.2d. 896 (D.C. Cir. 1985); Chevron, U.S.A., Inc. v. Natural Resources Defense Council, Inc., 104 S.Ct. 2778 (1984).

UNITED STATES SENATE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON NUCLEAR REGULATION

TESTIMONY OF THE

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ON THE

MISSION PLAN FOR THE CIVILIAN RADIOACTIVE WASTE MANAGEMENT PROGRAM

OCTOBER 30, 1985

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Chairperson Simpson and Members of the Subcommittee:

I am Edwyna G. Anderson, Commissioner of the Michigan Public Service Commission, a member of the National Association of Regulatory Utility Commissioners (commonly known as the NARUC), and its Committee on Electricity, as well as its Subcommittee on Nuclear Issues and its Subcommittee on Nuclear Waste Disposal. I am testifying today on behalf of the NARUC and am accompanied by my Staff Counsel, George F. Daniels; Subcommittee Staff Coordinator, Ronald C. Callen; and the NARUC's Director of Congressional Relations, Karen L. Hochstein.

The NARUC is a quasi-governmental, nonprofit organization founded in 1889. Within our membership are the governmental agencies of the fifty states and the District of Columbia, Puerto Rico and the Virgin Islands engaged in the regulation of utilities and motor carriers. Among other duties, the NARUC is the national representative of state commissions responsible for the economic regulation of utilities now operating nuclear-powered electric generating stations. As such, these commissions have been charged under law with the task of ensuring that the power provided by such generating stations is reliable and just and reasonably priced --- in short, that the public interest is protected.

My colleagues in state utility regulation and I greatly appreciate your invitation to testify today on an issue of great importance to ratepayers who receive electricity from nuclear power facilities --- the implementation of the Nuclear Waste Policy Act of 1982 (the Act) and the guiding Mission Plan for the Civilian Radioactive Waste Management Program (DOE/RW-0005). This unique, prescriptive law represents to us the embodiment of national policy on one of the most elusive socio-technical problems of modern times, the disposal of high-level nuclear waste.

Public utility commissioners across the nation have taken note of the Nuclear Waste Policy Act and its major effect on their conduct of electric utility regulation, including the impact on ratepayers. First and most important to our responsibilities, all ratepayers of utilities operating nuclear electric plants are now being assessed through their monthly electric bills for the entire cost of the decades-long federal high-level nuclear waste disposal program. Secondly, the orderly and predictable cost-effective removal of spent reactor fuel from temporary storage at in-state nuclear reactor sites is important to regulators in ensuring public safety and protecting expensive electric production capability. Lastly, the emplacement in a cost-efficient fashion of such highly radioactive wastes in a repository designed and constructed to safely isolate this long-lived radiation is of the utmost importance.

The creation of the Nuclear Waste Fund under Section 302 of the Act results in the assessment of one mill for each kilowatt-hour of electricity generated by nuclear fuel. Despite frequent references to utilities which are called on to collect the money, it is ratepayers who are the source of all waste disposal revenues.

For these reasons the NARUC established, by unanimous resolution at its 1984 annual meeting, its intention to investigate and monitor on an ongoing basis the national nuclear waste disposal program. The NARUC seeks to provide critical information to commissioners in all states and to impart to the Congress and the U.S. Department of Energy (DOE) the NARUC's unique expertise in utility regulation so as to enhance the federal program and assure that ratepayer funds are utilized most effectively. To implement the resolution, a standing Subcommittee on Nuclear Waste Disposal was established. This Subcommittee of the Committee on Electricity represents the views and position of the NARUC as contained in this statement.

The NARUC's Overall Position on the Federal High-Level Nuclear Waste Program

The driving force behind the NARUC's involvement in this federally-mandated process is the concern for sound fiscal management of the program. Recognizing the technical complexity, the public apprehension, the need for absolute assurance of safety, and the necessity in the public eye for administrative credibility, it is no wonder this program represents a vast financial commitment, now estimated to total $25 to 35 billion. And those program costs are all but assured to increase. My colleagues and I in commissions across the nation are required by law to judge the fiscal bases for the reimbursement by ratepayers of every penny of nuclear waste program payments made by utilities to date.

We face the prospect of further such reimbursement requests until the program ends some time in the next century. Thus, our central objective must be to assure ratepayers within our regulatory jurisdictions that their funds are being utilized wisely; that the management of this project is no less than excellent; and that, while efforts to minimize total costs are not undertaken in some "penny-wise pound-foolish" way, all controls, decisions and tasks are prudently and cost-effectively designed and carried to completion.

In identifying our designated responsibilities, the NARUC sees clearly roles that are not ours. We recognize the important role the Act has thrust upon us, but we also note that there are many other entities and institutions that have a part to play in this unfolding effort. We are not technical experts on nuclear issues and we will not invade that province. We are not charged with the responsibility to make judgments on safety. That responsibility rests with the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Environmental Protection Agency. We recognize other authorities in state governments who are designated and mandated to address repository siting decisions. The NARUC believes, however, that whatever contribution we and others provide to a fiscally well-managed, well-planned and well-executed program will also contribute to the safety of the overall program.

It is essential for the Congress to understand that our attention to this program conveys no lack of confidence in its management by the DOE. Recognizing the cost, scope and importance of the present effort, we of the NARUC must note, however, that the present DOE management and program represent only the latest in a long series of such efforts over a 30-year period, each devoted to solving the high-level nuclear waste problem. The fact is readily apparent that in the more than 30 years that have elapsed since nuclear power for peaceful purposes came into existence, program after program for disposal of nuclear waste has been planned, authorized, forces deployed, and then vanished, all without the disposal of a single spent fuel assembly. The NARUC believes it must expend every reasonable effort to contribute to the assurance that this latest, by far most costly, program is the final one, final because it has been successful. That goal brings us before you today to testify on the Mission Plan for the Civilian Radioactive Waste Management Program (Mission Plan).

Nuclear Electric Power Plant Construction

In attempting to place in focus the concerns and recommendations of the NARUC on high-level waste disposal program embodied in the Mission Plan, it is essential that the Congress first understand some of the painful learning experiences that public service commissioners have accumulated from nuclear power plant construction review. That this experience carries messages for the waste disposal program rests, to be sure, with the obvious nuclear focus of both arenas, but much more with the fact that this nation is once again moving toward construction of a very expensive first-of-a-kind facility proposed and licensed at the federal level. The safety licensing agency, the NRC, has repeatedly announced that cost occupies a lower priority on its agenda. It will be able to make changes in definition of an acceptable final facility throughout the construction program and perhaps even beyond. The constructor, the DOE, while possibly sufficiently cost-conscious, far more than finishing at a responsible final cost needs to finish, perhaps at all costs. Finally, total costs are to be laid at the feet of, or more aptly, in the pockets of ratepayers. Public service commissions are faced with the unenviable task of determining whether all future costs have been discovered and whether, to date, program costs were prudently incurred. Were the NARUC to wait for the present waste facility program to be concluded, as the regulatory scheme has called for with nuclear power plants, the resultant built-in gap in regulation would call for public service commission approval of every expense after the fact. If a less than complete or cost-effective program were conducted, the NARUC members would be left holding the fiscal bag, attempting to ferret out hidden construction or yet undiscovered operating or repair costs still to be passed on to ratepayers.

This is not a comment on the viability of the nuclear option. Rather, the NARUC is painfully aware that the national experience with deployment for generation of the nuclear option ranges from excellent to abysmal. You are aware of the troubled, expensive and varied history of the construction of nuclear electric generating stations. Whereas all nuclear construction completion costs have soared to levels never imagined by anyone years ago, the even more astounding fact is that despite massive infusions of capital, many plants were never finished. On the other hand, not all nuclear plant projects have been troubled.

Why did all this happen? Why have these companies had such different degrees of success? Is there a reasonable answer to the widely-varying results of performing essentially the same job? There are many reasons offered and perhaps all have some relevance. They include inflation, the influence of an aroused public, the very noticeably heightened regulatory activity of the NRC, the failing financial health of the electric industry, the dearth of capital, the declining demand for electric energy and the effectiveness or ineffectiveness of utility management itself. According to the U.S. Congressional Office of Technology Assessment,[1] seven major social institutions --- utilities, investors, the nuclear industry, nuclear critics, the public, the NRC and state public utility commissions ---all have played a significant part in this controversial technological evolution. The NRC[2] has some answers to our questions. So, too, do the Missouri Public Service Commission,[3] the New York Public Service Commission[4] and the Michigan Public Service Commission.[5] So do Forbes Magazine[6] and the present Secretary of Energy.[7] They all point to, among many other factors, the level of competence and aggressiveness of project management. The evidence points to management --- some, not all --- that underestimated the size and scope of the task before them and, as the challenges grew and complexity increased, repeatedly continued to underestimate the challenge.

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[1] Nuclear Power in an Age of Uncertainty, Washington, D.C., U.S. Congress, Office of Technology Assessment, OTA-E-216, February, 1984.

[2] W. Altman, T. Ankrum, W. Brach, Improving the Quality and the Assurance of Quality in the Design and Construction of Nuclear Power Plants, NUREG-1055, Washington, D.C., U.S. Nuclear Regulatory Commission, May 1984.

[3] Report and Order, In the Matter of --- Callaway Nuclear Plant ---, Jefferson City, Missouri, Missouri Public Service Commission, March 29, 1985.

[4] Release, "Commission Cuts $1.35 Billion from Shoreham Cost on Finding of Imprudence by LILCO," New York Public Service Commission, June 26, 1985.

[5] Staff of the Michigan Public Service Commission, Staff Investigation of Enrico Fermi 2 Nuclear Power Project, Michigan Public Service Commission, Lansing, Michigan, February, 1984.

[6] James Cook, "Nuclear Follies," Forbes Magazine, February 11, 1985.

[7] John S. Herrington, "The Challenge For Nuclear Power," Washington, D.C., Address by the Secretary of Energy, May 8, 1985.

We are sadder, but perhaps wiser, veterans of a process in which gaps in interests and responsibilities among utilities, state and federal regulators and others appeared, remained unresolved and which in the end were and will be left to public service commissions to overcome. We must then determine what impacts resulted and assign financial responsibility between shareholders and ratepayers according to what is prudent and what is not.

There are two very central conclusions we wish to draw from this brief description of a lengthy, complex, arduous, expensive and controversial experience. The first is that, despite all the acknowledged changes, interruptions and reconsiderations, there are well-managed plants whose overall costs are, on an industry-wide basis, within reasonable limits. That is to prove that the job can be done.

The second is that there are gaps in regulation of nuclear plant construction among and between safety considerations that influence design and redesign, the response of utility management in controlling construction by contractors, and the ultimate act by utility commissions in sorting out legitimate construction costs from imprudent cost overruns.

We see these expensively-obtained conclusions as directly and fully applicable to the nuclear waste disposal process. Consider the first. The effectiveness of nuclear waste program management will assuredly have enormous impact on the cost of the final repository and on the overall disposal program. It is, therefore, the NARUC's intention to do whatever it can to contribute to the understanding of the extreme importance of excellent program management and to take whatever measures it can to help assure such management. This input must be made at the outset, especially early in the design phase. Clearly, we cannot await the close of the program only to be met with untenable financial consequences comparable to the size of nuclear power plant construction overruns.

Secondly, the NARUC seeks to reach out to overcome any jurisdictional, management or regulatory gaps among major partners in the waste program, without interfering with any other entity's purview or prerogative. However, that means that we will not wait until 1990 or 2010 for whatever price tag may eventually result from the deliberations and conclusions of the other parties. Our mandated responsibility to ratepayers requires our full involvement from the start of the assessment of the nuclear waste project to assure that cost-effective decisions are made throughout the program. We cannot willingly and passively allow for repetition of nuclear power plant experiences in which early, preconstruction estimates of total plant costs turned out to be far less than even final interest charges. Thus, we of the NARUC pledge our best effort to cooperate and to share whatever is relevant in our experience so that the disposal program will be safe, successful and cost-effective.

Since ratepayers, who now are the full financial providers of the nuclear option, will continue to be so assessed as long as the expenses are legitimate, it is the NARUC's responsibility and desire to contribute to the program to:

(1) share with federal authorities our experience and expertise in nuclear project management assessment;

(2) see that no jurisdictional areas are left untouched, thus eliminating or overcoming any gaps in the regulatory process;

(3) assure all possible cost-consciousness is exerted in the conduct of the program;

(4) assure ratepayers that the NARUC is contributing to the development of a safe and successful disposal program; and

(5) contribute to the development of a full and fair public hearing process.

Mission Plan for the Radioactive Waste Management Program

The Department of Energy is to be commended for the obviously substantial effort required to create and publish the Mission Plan. We also wish to commend the Congress for requiring, through the Act, that a plan be produced. This document, appended by a number of relevant reports, details the federal program to a considerable extent. We note that this latest version of the Mission Plan is a substantial improvement over earlier drafts. There is apparent considerably more effort devoted to program direction than ever was evident before. To its credit, the DOE has exposed more of its deliberations leading to its decision-making. Candor invites more intelligent critique by all serious reviewers. Examples of program improvements include demonstrated recognition by the DOE that the goal of the disposal program is the development of an integrated system for fuel handling and disposal, not merely the construction of a repository. Also evident is the development of a cost-consciousness which should spell the beginning of a cost-control mentality.

Two-thousand five-hundred comments were received from 100 commenters during the revision of the Mission Plan. It is important to note, however, that several subjects of the Mission Plan, while sometimes adequately covered, raise issues that at other times are not resolved. Therefore, the NARUC wishes to bring before you the following specific areas of concern:

1. Program Costs and Estimates
2. Program Management
3. U.S. Defense Wastes
4. Monitored Retrievable Storage System (MRS)

1. Program Costs and Estimates

Not reported in the Mission Plan, but acknowledged elsewhere by the DOE, is the fact that the present 1 mill fee even now appears inadequate to supply sufficient income. If true, present and past ratepayers are not and never will be assessed sufficiently to pay true disposal costs. This raises a dilemma, since the program is not being based on cost-effective decisionmaking and an increased fee cannot now be justified. Yet, the NARUC is also concerned that schedule delays and as yet unanticipated activities will raise program costs even higher than the present $25-35 billion figure, with sobering consequences for future ratepayers.

The NARUC is concerned with the DOE's use of a "mid-case" estimate (U.S. Energy Information Agency) of the amount of nuclear electric generation that constitutes the basis for its estimates for ultimate waste disposal. This "mid-case" estimate presumes a very substantial increase in nuclear plant construction over the present nuclear generation, including units now under construction. If a "no new orders" future occurs with regard to nuclear power plant construction, the DOE's estimates show program expenses will be reduced by $3 billion, but income would be reduced by $9 billion. Spent fuel inventory would be reduced below 100,000 metric tons of uranium (MTU). If extended burnup were included, the inventory might be reduced to 80-85,000 MTU as shown in a contractor's report[8]. This raises substantial questions about the need and cost implications for two repositories and on the planning basis for the entire program.

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[8] C.M. Heeb, et al, Reactor Specific Spent Fuel Discharge Projections: 1984 to 2020, Richland, WA, Battelle Pacific Northwest Laboratories, PNL-5396, April, 1984.

Estimated costs for a variety of program options are outlined in considerable detail (Mission Plan, Volume II, Chapter 15). As has consistently been the case, the cost analysis being used is not for the current program, but rather a previous one. The present cost data do not reflect the DOE decision to incorporate an MRS in the overall system. Although the cost of an MRS has been estimated, as the DOE states, the range of that estimate does not appear to coincide with earlier estimates made by the U.S. Congressional Budget Office. This problem apparently stems from the fact that the DOE makes program decisions before obtaining substantive cost data as input to decisionmaking.

Below is a table which shows the repeated failure of the DOE to utilize cost data in the decisionmaking process:

TABLE I
LAG OF NUCLEAR WASTE PROGRAM
COST ESTIMATES

Program Definition Document/Date	Program Cost Evaluation Document/Date
Early Draft Mission Plan, 12-83	Draft Mission Plan, 4-84
Draft Mission Plan, 4-84	Total System Life Cycle Cost Analysis, 1-85
Mission Plan, 6-85	Fee Assessment, 1-86 (Anticipated)

The NARUC is very concerned that cost data are not an integral part of the planning mechanism and that severe financial impacts could occur. Ratepayers, we believe, may not be well served by the present order of activity.

2. Nuclear Waste Program Management

A fully successful outcome of the nature desired by the NARUC is not necessarily guaranteed in today's and tomorrow's program. As with nuclear plant construction and operating programs, redirection, repetition, rework, repairs or redesign in the waste disposal program due to changes in approach and late regulatory decisions or political expediency can produce negative effects. Cost increases result not only from repeating the same job, but also because all parts of the program are then delayed. That time is money is nowhere more dramatically shown than in nuclear power plant construction. Loss of public confidence also flows from such delays; this result could be the most devastating impact on the nuclear waste program. The history of nuclear plant construction indicates that logical products of public upset are rounds of criticism, voluntary or involuntary regulatory response, added safety requirements, more delays and assuredly more costs. Careful, thoughtful planning, full and fair public hearings and excellent waste program management could enable us to avoid a repetition of historical nuclear power plant failures and omissions.

More specifically, let us now turn to aspects of nuclear waste program management of concern, as spelled out by DOE in the Mission Plan.

One troublesome area of program management that touches deeply on lessons learned from nuclear power plant construction is the meeting of established program deadlines. There have been numerous missed deadlines by the Office of Civilian Radioactive Waste Management (OCRWM). Table II (pg. 13a) shows some of the most important deadlines that have been missed. These delays have been mentioned and discussed by many reviewers. For example the U.S. General Accounting Office (GAO), in its 1984 annual audit, chastises the DOE for not formally alerting the Congress in a timely way to several important missed deadlines. The Mission Plan does not lay out this problem since deadlines and compliance dates are not compared.

There are a variety of reasons, we are told, that deadlines, imposed by the Congress and some planned by the DOE have not been met. We acknowledge wholly unanticipated levels of public response, the uniqueness and complexity of certain tasks, and perhaps the unreality of deadlines embodied in the Act.

However, it appears that the failure to meet deadlines is expected to continue. The DOE now believes it will miss the site characterization and first repository recommendation to the Congress by four years; but it must be recognized that even this prediction is six years in prospect, hence subject to considerable reevaluation. Furthermore, the predicted date slipped nine months in the last 14 months.

The DOE, perhaps tenuously, still holds to the 1998 date for spent fuel acceptance. The DOE tells us success will require: NRC speed in approving licensing, minimal delay from what is a growing court agenda, and development among the public of extensive credibility in the program. However, these program time threats cannot be ignored. Viewed in historical context, they are very much the same story as happened repeatedly to federal efforts over the last 30 years to dispose of high-level waste. The NARUC believes that, considering no discussion is given in the Mission Plan of past experience or acknowledgement of the DOE's missed deadlines, the statement ". . . the current organization and management system reflect the application of lessons learned from the history of the radioactive waste programs," (Mission Plan, Volume II, page 304) is not borne out by the DOE's program results.

As for public acceptance, the DOE, much to its credit, has recognized the need to communicate openly, frequently and successfully with the public. This is a formidable and challenging necessity. The DOE elevated the function to the highest management levels in its organization by creating an Office of Policy, Integration and Outreach. Some public response has been predictably negative. Results seem to us, however, to suggest that the DOE's good intentions simply have not borne substantial fruit in that not much widespread public acceptance has been achieved. It appears that far greater and more negative response was received than anticipated by the DOE. The two best examples are responses to the site selection guidelines and the subsequent responses to the draft Environmental Assessments. The NARUC believes that the Congress should be very concerned with the disparity between the DOE effort at communication and the lack of public response in the form of understanding and acceptance.

As for the DOE management performance, the NARUC sees signs that all may not be well. The present leadership is perhaps the most extensive and overall competent management of the U.S. high-level waste program ever assembled and we recognize that its personnel have been at work a rather short time. However, signs of difficulty are now evident. While somewhat better than that in the draft Mission Plan, the revised chapter on management (Mission Plan, Volume I, Chapter 5) is not insightful in explaining operations and control and, in itself, does not contribute very much confidence to program perceptions. For example, the DOE states the primary monitoring tool to be utilized is the Project Management System. While it may or may not be helpful (too little evidence is given in the Mission Plan), it is not yet developed.

As another example, the DOE alludes (Mission Plan, Chapter 5, page 160) to peer group input to management, input from states and from ongoing or to-be-organized peer committees. The NARUC believes that those states deeply concerned as possible repository sites simply are not in business to advise the DOE on its management improvement. Yet, there are a large number of organizations that, through their own demonstrated conduct of difficult technical programs or because of their management consultation expertise, could assist the DOE and the Congress in management assessment. The NARUC knows of peer committees that provide to the DOE important advice on technical issues. We are not, however, aware of management review advisory bodies or peer groups.

It appears the DOE has largely dismissed the findings of the Advisory Panel on Alternatives to Managing and Financing Radioactive Waste Facilities (AMFM Panel), the only such committee on management of which the NARUC has been aware. The DOE explicitly states in the Mission Plan that it does not include the AMFM Panel's advice.

As another example, the GAO has made a series of findings and recommendations which we believe are very important. Among them is the need for extensive and consistent audit of program contractors and subcontractors, recognizing that about 85% of all nuclear waste expenditures is by these parties and that the GAO finds that systematic and uniform audit has not occurred. We are told by the GAO that the DOE has seen fit to largely resist its recommendations.

The NARUC is concerned for these reasons, that the DOE program management, certainly not without a salutary sense of mission and an aggressive intent to succeed at this very formidable task, is attempting to resist a great deal of outside criticism. Granted, some advice is distractive and even intentionally counterproductive, but some of it appears to us to be helpful and usable.

The NARUC was pleased to note (Mission Plan, Volume I, page 156) that "OCRWM has contracted with a certified public accounting firm for an independent annual financial audit to reassure the utilities, the public utility commissioners, and the electricity consumers who ultimately pay most of the fees, that generally accepted accounting principles are observed and that the financial statements and presentations of the OCRWM fairly and accurately present the financial conditions and operations of the Nuclear Waste Fund." The NARUC understands that the DOE has included this review, in part, to place the program on a "business-like" basis. Such moves to strengthen the program also bring credibility to it.

3. Disposal and Funding of U.S. Defense Wastes

The Mission Plan makes limited general reference to plans by Presidential decision to include defense wastes in the two mandated nuclear waste repositories. This, however, is an issue which must be adequately addressed in planning to assure safety and fiscal integrity. For the design of defense waste disposal in the repository, the physical constituency of the waste ---volume, heat rate and chemical make-up --- will substantially affect the physical process and, hence, the cost of disposal. The Mission Plan, making only limited reference to the differences between defense waste and civilian waste, promotes little understanding of the effects of these differences, makes no commitment to the amount of defense waste to be buried and gives no indication of ensuing cost impacts. No formula for defense cost burden is apparent or suggested and no schedule for payments is given.

Presently, defense wastes are housed at federal facilities at Hanford, Washington; the Idaho Nuclear Engineering Laboratory and at the Savannah River Plant in South Carolina. Current defense materials production continues to generate new waste. Old waste at Hanford is stored mostly in solid form in 149 single-shelled tanks, 20 of which are known to have leaked over the years. One serious spill is known to have leaked about 115,000 gallons of high level waste liquids. DOE has plans which apparently do not include removal of this waste. Wastes deposited at the Idaho facilities are scheduled for processing that will substantially increase their volumes and also apparently will not be removed to a nuclear waste repository.

Under current planning DOE estimates about 20,000 canisters of defense high level waste would require disposal. However, governors of the three states have, in response to public pressure, often called for removal from their states of all high level wastes. If their efforts are successful later, the disposal canister count could be far higher, and this could have a substantial non-linear impact on the size of the repositories and the funding split between the defense and commercial programs. Size of disposal geologic medium does not seem to be a limiting factor, but adequate size of the medium is of concern in planning. A major increase in waste inventory at a much later date could cause program disruptions if not sufficiently anticipated. Clearly, such contingencies should be considered now, long before construction has begun. Cost control then can be best realized.

The Defense Programs Office of the DOE is currently negotiating with the Office of Civilian Radioactive Waste Management, in camera, to determine an equitable allocation formula payment for defense waste disposal. The NARUC is concerned with the conflict of interest in a division within the DOE negotiating with the DOE's own OCRWM. The NARUC is concerned that the interests of ratepayers may not be adequately protected in such negotiations. In fact, the DOE budget could benefit from an agreement that allows the disposal of defense wastes to be subsidized by ratepayers. Following an agreement, the terms will be published in the Federal Register for comment; however, the agent to receive and resolve all recommendations and critique is the Department itself. The resolution process appears to the NARUC not to be very amenable to outside suggestion and gives no encouragement to thoughtful and concerned parties.

A formula for cost sharing has been recommended that the NARUC believes represents an equitable arrangement. Total life-cycle cost of separate repositories for defense and commercial wastes would be compared with the cost of the as-planned combined disposal facility. The cost savings so determined would be shared between the two programs on the same financial basis that would be employed in supporting the cost of separate facilities. This plan, advanced by the Edison Electric Institute, not only has the value of determining cost responsibility, but also results in identifying the defense programs and the commercial areas as partners in waste generation and as responsible agents for providing disposal expenses. It is thus that both partners should remain overseers and assessors of the entire disposal program to share the cost burden, management oversight and whatever future program cost increases result.

For this program, we believe that:

- the defense disposal cost sharing discussions should be immediately opened to input from interested and financially-responsible outsiders
- there should be assurance that cogent advice and criticism on defense payments are accepted and do influence the final decision
- the cost allocation formula should be based on cost savings resulting from commingling of defense and civilian wastes
- the Congress should ensure that the defense and commercial programs are to share on a similar basis, all future overall program cost increases
- a mechanism should be established to bill for defense wastes generated after a formula and payment procedure are established

- through establishment of interest charges, payments for defense waste should adequately reflect the delays in their receipt, compared to payments for civilian wastes begun in 1983
- a periodic review, e.g. biannually, should be made of the results of defense and commercial disposal cost changes so as to revise and update the share of cost responsibility resulting from all program changes

Implementation of these procedures would then represent the equitable means of "the allocation of costs of developing and, constructing, and operating this repository or repositories" and for paying "by the Federal Government, into the special account established . . . " as required by the Congress of the United States in the Nuclear Waste Policy Act of 1982.

4. The Monitored Retrievable Storage Facility Proposal

The Congress of the United States has reserved to itself the decision of whether to construct at this time an interim central spent fuel storage unit, referred to in the Act as a Monitored Retrievable Storage Facility (MRS). The NARUC neither supports nor opposes a decision to build an MRS. We have neither the technical nor the program information necessary to make such a judgment. We are, however, concerned that the Congress obtain the necessary information on which to come to and maintain a reasonable consensus. Our conclusions are as follows:

(1) The MRS has been a controversial issue for years and the impending decision no doubt will be a hard-fought one. Inadequate exploration of the advantages and disadvantages of the option could only confuse the issue, delay the Congress's decision, and heighten public apprehension and anxiety to a point which would induce massive opposition to either the proposed facility or to its proposed site despite the advantages that an MRS could be shown to have.

(2) A decision to build the MRS will surely negate some other system decisions, require new conclusions, and have cost, fuel acceptance schedule and safety ramifications that will reach throughout the waste disposal program.

(3) The MRS is an element of a disposal system, the total integration of which the DOE has committed to study. Obvious DOE support and enthusiasm for the MRS option must not diminish the independence, thoroughness, dispassionateness or comprehensiveness to be exerted by the DOE.

(4) The MRS, in part, may be felt to be needed to overcome storage problems brought on by past federal failures and delays in the current program. However, the MRS must not be utilized as a final answer to spent fuel disposal. It must be justified as a cost-effective addition to the overall system.

(5) In the integrated system analysis, it must be recognized that ratepayer financial responsibility encompasses not only the federal portion of the disposal process, but the at-reactor storage portion as well. Therefore, analyses must include evaluation of both portions in determining overall disposal costs.

(6) A decision to build an MRS will add significantly to the burden on the DOE management and staff and should be planned for well in advance. There should be no dissipation of DOE or contractor strength in pursuing the MRS.

(7) There should be no deliberate or inadvertent abandonment of the task of final disposal in the repository.

The NARUC's Opinion on the Overall DOE HLNW Disposal Program

The NARUC's review of and conclusions on the DOE program are still under development and are expected to so continue in the foreseeable future. The NARUC finds it important to release these present observations of the program and its conduct in the hopes of focusing attention on any necessary corrective response. We conclude that it is too early to decide if the federal nuclear waste disposal program will be successful, i.e., that it will reach the goal of safe and timely disposal of all the nation's spent reactor fuel and defense wastes. We also note that the federal disposal effort is more than 30-years old, the present program is more than two-years old, and the DOE currently is expending funds at the rate of about $500 million per year.

The NARUC finds:

(1) Program cost estimates are not released with program revisions because they are not developed; thus cost simply is not a decisional factor in the DOE program planning.

(2) Many deadlines, both those mandated by the Nuclear Waste Policy Act and those announced as internal decisions of the DOE, have been missed. Program delays are evident and, recognizing that the present disposal program is now some two years old (with 20 years yet to be completed), the threat of a substantially longer disposal project appears possible.

(3) The DOE has made a commendable effort to engage the public and state governments in productive encounter, but the response has not been favorable. There remains a need for effective public education and acceptance of the DOE response to public and state and local government concerns. Full and fair public hearings are a must.

(4) Overall program management remains of concern. The DOE's field office approach has been criticized; the very large percentage of total expenditures by contractors raises questions of programmatic and fiscal control; a program-wide planning and control system still is not in place.

(5) We have found no evidence that the very large departmental program expenditures, especially in view of the fact that construction has not yet commenced, have been independently thoroughly reviewed. The GAO's finding that periodic and uniform contractor audit has not occurred is disturbing.

(6) We have a sense that the DOE, when anticipating even larger-than-announced future program increases, may tend to look to fee increases as solutions. We must emphasize that there is a limit, both considering equity and ability to pay, to funding by ratepayers for nuclear waste disposal.

(7) There is a crucial need for overall acceptance by DOE observers, critics and correspondents of the Mission Plan as a vehicle that delivers a conservative, predictable and successful program that will conclude on a reasonably certain schedule, one that utilities can confidently employ in their planning.

(8) The NARUC is troubled by the prospect of discussion and decision, totally internal to the DOE, of what are to be equitable payments to the Nuclear Waste Fund for defense waste disposal. The Fund must soon receive payment for the fair share of embedded costs and for the time value of money not contributed to date. The defense payments decision by the DOE must receive adequate public review and all needed revisions must be incorporated in the final financial assessment.

(9) A decades-long discourse has ensued over the management structure of the waste disposal program. The Congress recognized the importance of the issue in the Nuclear Waste Policy Act and the DOE formed the Advisory Panel on Alternative Means of Financing and Managing Radioactive Waste Facilities to review this and related matters. When a thoughtful report was received, the Department dismissed or deflected most of the recommendations it contained. The NARUC is troubled by this response. While we are not ready to endorse the AMFM Panel recommendations per se, we are concerned about the DOE's response. This conclusion is not designed to embarrass the DOE, but rather to underscore the NARUC's view of the extreme importance of the disposal program to the public safety and to a sense of program financial well-being.

(10) Finally, the NARUC is concerned with a need for intense attention, review and audit both internally by the DOE and externally by the Congress and whoever else it designates and others of the issues we have raised, and those others brought forward by intelligent and constructive program critics. The root strengths, problems and prospects for this latest national program must be determined and the necessary corrections made promptly.

Conclusion

The NARUC appreciates the opportunity to address the Congress on this issue of such importance to nuclear electric ratepayers across the country. It is our duty and our pleasure to attempt to contribute to the evaluation of this difficult program. It is our intention, as previously stated, to use our expertise to contribute to the strengthening of the program so as to lead to its success, an objective that should be on everyone's agenda. However, the NARUC cannot in the alternative sit by and wait for the manifestly easy temporary solution, the raising of the Nuclear Waste Fund fee.

TESTIMONY OF
DOROTHY G. COLE
PRESIDENT
PERRY COUNTY CITIZENS AGAINST NUCLEAR DISPOSAL, INCORPORATED
STATE OF MISSISSIPPI

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

OCTOBER 30, 1985

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE:

I AM DOROTHY G. COLE, A CITIZEN OF RICHTON, MISSISSIPPI. I AM PRESIDENT OF THE PERRY COUNTY CITIZENS AGAINST NUCLEAR DISPOSAL, INCORPORATED, AND I WOULD LIKE TO MAKE THE FOLLOWING COMMENTS.

I WOULD LIKE TO REFUTE A STATEMENT THAT HAS BEEN MADE BY THE DOE ABOUT THE RICHTON DOME SITE, MISSISSIPPI, AND I (QUOTE) "FURTHERMORE, THE AREA DOES NOT POSSESS ANY AESTHETICALLY UNIQUE FEATURES."(END QUOTE). I WOULD LIKE TO REMIND YOU THAT AESTHETIC REFERS TO BEAUTY AND THAT BEAUTY IS IN THE EYES OF THE BEHOLDER. THE DEPARTMENT OF ENERGY MAY ADMIRE AND DESIRE TO PRESERVE THOSE VAST CITIES OF HORDES OF HUMANITY AND CONCRETE BUT THE PEOPLE OF MISSISSIPPI VIEW RICHTON AND ITS SURROUNDING COUNTY AS A BEAUTIFUL AND SCENIC AREA.

UP TO THIS TIME WE HAVE TRIED TO PRESERVE THE LAND AND ITS FLORA AND FAUNA FOR THE ENJOYMENT AND USE OF OUR PEOPLE. I RESENT THE FACT THAT SOME COMMITTEE DECIDED THAT RICHTON IS NOT A BEAUTIFUL PLACE TO BE.

ALL THROUGH THE DRAFT EA THE TERMS "QUALIFYING CONDITIONS' VERSUS 'POTENTIALLY ADVERSE CONDITIONS' IS USED. THE DOCUMENT IS BIASED IN USING SUCH TERMS. IT DOWN PLAYS THE CONDITIONS THAT WOULD DISQUALIFY THE RICHTON SALT DOME AND IMPLIES THAT THE QUALIFYING CONDITIONS ARE MORE FAVORABLE.

THE RICHTON, MISSISSIPPI, SALT DOME HAS BEEN UNDER INVESTIGATION BY THE DEPARTMENT OF ENERGY SINCE 1976 AS BEING A POTENTIALLY ACCEPTABLE SITE FOR DEVELOPMENT AS A REPOSITORY.

NUMEROUS QUESTIONS HAVE BEEN RAISED BY OUR CITIZENS REGARDING THE SOCIOECONOMIC IMPACTS THAT COULD BE EXPECTED AND THE MEANS BY WHICH THE DEPARTMENT OF ENERGY WOULD ATTEMPT TO ANSWER THESE UNCERTAINTIES.

WE STILL BELIEVE A COMPLETE SOCIOECONOMIC IMPACT ASSESSMENT FOR THE RICHTON, PERRY COUNTY SALT DOME IS ABSOLUTELY NECESSARY. THE DOCUMENT "SOCIOECONOMIC DATA BASE REPORT FOR MISSISSIPPI" (ONWI-499,BNI,1984)(PAGE 3-114 DRAFT EA) FROM WHICH THE INFORMATION SUMMARIZED FOR THE ENVIRONMENTAL ASSESSMENT WAS TAKEN FROM, SIMPLY DOES NOT PROVIDE ADEQUATE DATA TO ACCESS THE TRUE NEEDS OF THIS AREA, GIVING THE NET RESULT OF A FLAWED DOCUMENT (ONWI-499). THE GEOGRAPHIC COVERAGE REMAINS INADEQUATE BOTH IN ITS EXTENT AND IN ITS DEGREE OF FOCUS. THE MISSISSIPPI GULF COAST COUNTIES SHOULD HAVE BEEN INCLUDED IN THE STUDY REGION. THE CONCERNS OF THE RESIDENTS OF THE GULF COAST REGION ARE NOT WITHOUT BASIS, PARTICULARLY WHEN ONE CONSIDERS THE IMPORTANCE OF TOURISM TO THE REGION AND THE FACT THAT GROUND-WATER FLOWS ARE PREDOMINANTLY IN THE DIRECTION OF THE COAST. ANOTHER IMPACT THAT EXTENDS BEYOND THE EIGHT-COUNTY AREA IS TRANSPORTATION IMPACTS WHICH WOULD BE FELT ALONG CERTAIN CORRIDORS THAT CROSS THE ENTIRE STATE. THE DATA PRESENTED ARE WHOLLY INADEQUATE IN THEIR FOCUS ON THE MANY IMPACTS THAT ARE LIKELY TO BE EXPERIENCED OR HAVE ALREADY BEEN EXPERIENCED PREDOMINANTLY IN PERRY COUNTY AND/OR THE IMMEDIATE RICHTON VICINITY. CERTAIN IMPACTS ARE ALREADY BEING

FELT IN THE RICHTON VICINITY. HOWEVER, IT IS AN EVEN MORE SIGNIFICANT ERROR THAT THE TECHNICAL REPORTS FAIL TO PROVIDE THE MORE DETAILED DISCUSSION OF IMPACTS THAT IS NEEDED TO UNDERSTAND THE WAYS IN WHICH THE RICHTON/PERRY COUNTY AREA IS BEING AFFECTED BY REPOSITORY-RELATED ACTIVITIES.

THE SOCIOECONOMIC DATA **MAKES INADEQUATE USE OF AVAILABLE DATA.** THERE IS VIRTUALLY NO EVIDENCE THAT THE DEPARTMENT OF ENERGY AND ITS CONTRACTORS HAVE CONSULTED OR CONSIDERED THE MANY EXISTING STUDIES ON THE REGION, ITS HISTORY, PEOPLE OR CULTURES. FOR EXAMPLE, THE DESCRIPTION OF THE "LOCAL HERITAGE" STOPS IN 1861-JANUARY OF 1861-TO BE SPECIFIC. ONE CANNOT IMAGINE THAT THE DEPARTMENT OF ENERGY OR ITS CONTRACTORS WOULD WISH TO CLAIM THAT THEY HAVE BEEN UNABLE TO FIND ANY INFORMATION ON THE REGION FOR THE PAST 120 YEARS, NOR THAT ABSOLUTELY NOTHING OCCURED IN THE REGION FOR THE PAST CENTURY OR MORE IS DEEMED TO BE WORTHY OF CONSIDERATION. EVEN THE ECONOMIC AND DEMOGRAPHIC COMPONENTS OF SOCIOECONOMIC ANALYSIS-THOSE COMPONENTS FOR WHICH THE EXISTING DATA BASE, IF PROPERLY CONSULTED, WOULD HAVE PROVIDED THE MOST INFORMATION...ARE NOT GIVEN ADEQUATE CONSIDERATION. FOR EXAMPLE, THERE IS NO DISCUSSION OF THE EVIDENCE BEHIND LOCAL RESIDENTS' STRONG BELIEF THAT EVEN BEING CONSIDERED AS A POTENTIAL REPOSITORY SITE HAS CREATED SIGNIFICANTLY NEGATIVE IMPACTS, EVEN THOUGH THESE BELIEFS APPEAR TO BE REALISTIC AND DESERVING OF CONSIDERATION. THERE APPEARS TO BE SOME EVIDENCE THAT THE

DEPARTMENT OF ENERGY'S DECISION TO CONSIDER THE COMMUNITY AS A POTENTIAL NUCLEAR WASTE REPOSITORY LED INVESTORS TO AVOID THE AREA TO DEFER INVESTMENTS IN EMPLOYMENT-PRODUCING ACTIVITIES DURING THE PAST SEVERAL YEARS. THESE CONCERNS NEED TO BE TAKEN SERIOUSLY, AND INDEED, EVEN THE DATA PRESENTED IN THE DRAFT EA'S REPORT SHOW UNEMPLOYMENT IN PERRY COUNTY ALMOST DOUBLING, FROM 8.4% TO 16.1%, BETWEEN 1980 AND 1982, AN INCREASE THAT IS ESSENTIALLY DOUBLE THE STATEWIDE INCREASE AND TRIPLE THE NATIONAL INCREASE IN UNEMPLOYMENT DURING THE SAME TIME. YET, RATHER THAN PRESENTING THE EVIDENCE THAT WOULD BE NEEDED TO ACCESS THESE CONCERNS EMPIRICALLY THE REPORT INSTEAD CONCLUDES INEXPLICABLY THAT THE DRAMATIC INCREASE IN PERRY COUNTY'S UNEMPLOYMENT "MAY BE DUE TO A DECLINE IN AGRICULTURAL EMPLOYMENT" (PAGE 30)...EVEN THOUGH THE REPORT'S OWN TABLES (PAGE 27) SHOW THE COUNTY'S AGRICULTURAL EMPLOYMENT TO HAVE EXPERIENCED A NET DECLINE OF ONLY 40 JOBS DURING THE TEN YEAR PERIOD OF 1971-1981.

DESPITE THE STATE'S EXPLICIT CRITICISMS, THE FINAL DRAFT OF THIS DOCUMENT (ONWI-499) STILL CONTAINS VIRTUALLY NO USEFUL INFORMATION ON PSYCHOLOGICAL, CULTURAL, AND RELATED SOCIOECONOMIC IMPACTS BEING CREATED BY REPOSITORY-RELATED ACTIVITIES.

THE INADEQUACIES IN ASSESSING SOCIOCULTURAL. INSTITUTIONAL, SOCIAL-PSYCHOLOGICAL AND SEVERAL OTHER CATEGORIES OF SOCIOECONOMIC IMPACTS PROVE THAT THERE IS SO LITTLE USEFUL INFORMATION CONTAINED ABOUT THESE TYPES OF IMPACTS THAT WE FEEL THE SOCIOECONOMIC DATA USED BY THE DEPARTMENT OF ENERGY CLEARLY

FAILS TO PROVIDE EVIDENCE OF A GOOD-FAITH EFFORT TO ASSEMBLE THE TYPES OF INFORMATION THAT WILL BE NEEDED IF DECISION MAKERS ARE TO BE ABLE TO CONSIDER EVEN THE MOST SIGNIFICANT OF THE IMPACTS OF REPOSITORY/RELATED ACTIVITIES, AND EQUALLY CLEARLY, ONE CAN ONLY CONCLUDE THAT THE REPORT PROVIDES A THOROUGHLY INADEQUATE BASIS FOR MAKING PROPERLY INFORMED DECISIONS.

IT IS EVIDENT THAT THERE IS CARELESSNESS AND LACK OF ATTENTION TO SIGNIFCANT DETAILS. EVEN THE DEPARTMENT OF ENERGY EMPLOYEES WHO ARE NOT SOCIAL SCIENTISTS, IF THEY HAVE EVEN VISITED THE REGION, SURELY COULD NOT FAIL TO REALIZE THAT PROFOUND IMPACTS HAVE ALREADY BEEN CREATED IN THE HOSTILITY AND LOSS OF CREDIBILITY THAT THE DEPARTMENT OF ENERGY'S OWN ACTIONS HAVE INSPIRED IN THE LOCAL POPULACE. YET NO MENTION IS MADE OF THESE IMPACTS, NOR OF THE PROBLEMS THAT WOULD FOLLOW FROM THESE IMPACTS, IF A REPOSITORY WERE TO BE LOCATED IN THE REGION. ALSO IGNORED ALTOGETHER ARE SUCH MATTERS AS VALUES, COMMUNITY COHESION, TRUST IN INSTITUTIONS, THE CULTURAL SIGNIFICANCE OF THE LAND AND THE NETWORKS OF SUPPORT AND CONTROL THAT ARE SO IMPORTANT TO THE LOCAL WAYS OF LIFE THAT ONE COULD NOT HOPE TO UNDERSTAND THE LOCALITY WITHOUT GIVING THEM CAREFUL CONSIDERATION. AND THIS IS ONLY A PARTIAL LISTING OF THE OMMISSIONS. THESE AREAS MUST BE FURTHER ADDRESSED AND CONSIDERED IN THE FINAL RECOMMENDATION FOR SITES TO BE CHARACTERIZED.

THE RICHTON DOME SITE HAS THE LARGEST NEARSITE POPULATION DENSITY OF ALL OF THE FIVE SITES BEING CONSIDERED. IN FACT, THERE ARE PEOPLE LIVING ON THE DOME SITE. THE TOTAL POPULATION WITHIN A 50-MILE RADIUS OF RICHTON IS APPROXIMATELY ONE MILLION (1,000,000) PEOPLE. CONSIDERATION MUST BE GIVEN TO THESE FACTS PRIOR TO YOUR NOMINATION OF RICHTON FOR SITE CHARACTERIZATION OR AS A REPOSITORY AND MUST BE FURTHER ADDRESSED ALLOWING RICHTON TO BE ELIMINATED FROM CONSIDERATION FOR THE REPOSITORY. HUMAN LIFE AND SAFETY MUST TAKE TOP PRIORITY IN ALL OF THE WEIGHT FACTORS FOR BOTH PRECLOSURE AND POSTCLOSURE. RICHTON SALT DOME MUST NOT BE CHOSEN BECAUSE OF ITS LARGE **SIZE AND EASY** ACCESS WHICH HAS BEEN DONE IN PAST EVALUATIONS.

FOR SEVERAL YEARS WE HAVE HEARD A LOT OF TALK ABOUT THE ECONOMICAL BENEFIT OF A REPOSITORY. WE HAVE FAILED TO DETERMINE THAT THE RICHTON AREA WOULD BENEFIT ECONOMICALLY FROM EITHER SITE CHARACTERIZATION OR A REPOSITORY. THE DRAFT ENVIRONMENTAL ASSESSMENT ESTIMATES THAT OF THE IN-MIGRATING WORKERS, 40% WOULD LIVE IN HATTIESBURG, 15% IN LAUREL, 20% IN RICHTON AND 10% IN PETAL. WE HAD RATHER ESTIMATE THAT IT WOULD BE 10% RICHTON AND 20% PETAL. THE STATE OF MISSISSIPPI WAS INFORMED THAT THE GREATER AMOUNT OF THE ONE BILLION DOLLARS TO BE SPENT DURING SITE CHARACTERIZATION WOULD BE SPENT OUTSIDE OF THE STATE AND THAT WOULD PROBABLY MEAN THAT NIL WOULD BE SPENT IN THE RICHTON/PERRY COUNTY AREA. EVEN THE COMMUTER AND NUCLEAR WASTE TRAFFIC WOULD

BE ROUTED AROUND THE TOWN OF RICHTON (AS IT SHOULD BE), THEREFORE, NONE OF THE EARNINGS BY THE WORK FORCE AT THE FACILITY WOULD BE SPENT IN RICHTON. RICHTON WOULD ONLY GET THE ADVERSE EFFECTS SUCH AS INFLATION, INCREASE IN CRIME AND MALADJUSTMENT OF INCOME VERSUS COST OF LIVING.

WE CONTINUE TO HAVE LEGITIMATE CONCERNS REGARDING THE VALUE OF OUR PROPERTY AND PROSPECTS FOR FUTURE DOMESTIC, COMMERICAL AND INDISTRIAL DEVELOPMENT AROUND THE DOME. REAL ESTATE SALES **HAVE** DECLINED. SUB-DIVISIONS **ARE** UNDEVELOPED AND THE INABILITY TO ATTRACT FUTURE INDUSTRAIL AND/OR AGRICULTURAL DEVELOPMENT IS DUE TO THE UNCERTAINTY ASSOCIATED WITH A POTENTIAL DEVELOPMENT OF A MAJOR NUCLEAR WASTE FACILITY. WE FEEL THAT THE PROPERTY SHOULD BE APPRAISED AT THE TOP MARKET VALUE, BEFORE THE PRICES WERE DEPRESSED BECAUSE OF THE REPOSITORY CLOUD, PLUS COST OF INFLATION FOR THE PAST SEVERAL YEARS. WE THINK THAT LAND/AND/OR HOME OWNERS SHOULD BE ALLOWED TO EXCHANGE THEIR LAND/AND/OR HOMES FOR LAND/AND/OR HOMES OF EQUAL VALUE.

THERE COMES AGAIN ANOTHER POINT. A DECISION MUST BE MADE REGARDING THE WITHDRAWAL OF LAND, NOT ONLY FOR A REPOSITORY, BUT ALSO FOR SITE CHARACTERIZATION OF A SITE AS BEING ACCEPTABLE FOR THE DEVELOPMENT OF THE REPOSITORY. THE EA DRAFT FAILS TO ADDRESS THE FACT THAT GREATER THAN 35% OF PERRY COUNTY IS ALREADY OWNED BY THE FEDERAL GOVERNMENT. THEREFORE, IT IS VERY UNLIKELY THAT

RESIDENTS AND/LAND OWNERS DISPLACED COULD PURCHASE PROPERTY WITHIN THE COUNTY.

WE FEEL THAT THE DEPARTMENT OF ENERGY THE NUCLEAR REGULATORY COMMISSION AND THE ENVIRONMENTAL PROTECTION AGENCY SHOULD BE REQUIRED TO COME TO AN AGREEMENT ON WHAT CONSTITUTES THE "ACCESSIBLE ENVIRONMENT" AND THE "CONTROLLED AREA", INCLUDING THE DEGREE OF CONTROL, THAT WILL BE REQUIRED FOR THE RICHTON SALT DOME AREA, **BEFORE** THE RICHTON DOME IS RECOMMENDED FOR EITHER SITE CHARACTERIZATION OR A REPOSITORY. THEY SHOULD ALSO BE REQUIRED TO DETERMINE THE EXACT AREA THAT WILL BE REQUIRED TO EXERCISE JURISDICTION AND CONTROL OVER SURFACE AND SUBSURFACE ESTATES OUTSIDE OF THE CONTROLLED AREA.

THE ANXIETIES OF THE INDECISIVENESS OF THE DEPARTMENT OF ENERGY AND ITS PREDECESSOR AGENCY ENERGY AND RESEARCH DEVELOPMENT ADMINISTRATION, HAVE TORMENTED THE CITIZENS OF THE STATE OF MISSISSIPPI. THERE IS ABSOLUTELY NO REASON FOR CITIZENS OF THIS, THE FREEST OF NATIONS IN THE WORLD, TO BE SUBJECTED TO INSENSITIVITIES AND INCOMPENTENCE BY AN AGENCY OF THE GOVERNMENT WHICH WE CALL OUR OWN. AND YET AFTER HUNDREDS OF VOLUMES AND MILLIONS OF DOLLARS, THE DEPARTMENT OF ENERGY IS STILL ASSUMING THE "ACCESSIBLE ENVIRONMENT" FOR THE RICHTON DOME.

OUR GOVERNMENT HAS BEEN LESS THAN CANDID WITH US AS DEMONSTRATED BY THE DOE'S REFUSAL TO ADHERE TO THE PROVISIONS FOR CONSULTATION AND COOPERATION AS SET FORTH IN THE NWPA SEC.

117(6). PUBLIC ACCESS TO THE DECISIONS BY AN AGENCY OF THE FEDERAL GOVERNMENT IS ABSOLUTELY CRITICAL TO CONFIDENCE IN THE GOVERNMENT'S PROGRAMS TO DEVELOP AN APPROPRIATE TECHNOLOGY FOR THE DISPOSAL OF NUCLEAR WASTE.

PERRY COUNTY, LIKE MANY COUNTIES IN MISSISSIPPI, RELIES ON THE LAND RATHER THAN INDUSTRY TO PRODUCE MANY OF OUR MARKETABLE COMMODITIES. WE ARE PROUD OF THE FACT THAT WE PRODUCE ONE OF NATURE'S RENUABLE RESOURCES--TIMBER. THERE ARE SEVERAL ISSUES THAT SHOULD BE FURTHER CONSIDERED BY THE DEPARTMENT OF ENERGY RELATED TO THE TIMBER RESOURCE PRIOR TO NOMINATING THE RICHTON DOME FOR SITE CHARACTERIZATION OR A REPOSITORY. THE WINDBLOWN SALT, CAUSING NEEDLE BURN COULD DEVASTATE OUR TIMBER LANDS.

IN ADDITION TO TIMBER PRODUCTION AS A MARKETABLE COMMODITY, WE RELAY HEAVILY ON THE TIMBER PROCESSING INDUSTRY TO ADD TO OUR TAX BASE.

THE GREAT NORTH NEKOOSA PAPER COMPANY IS CONDUCTING THE LARGEST INDUSTRY IN THE COUNTY. THE TRACT OF LAND THAT IS TO BE THE CENTRAL AREA FOR SITE CHARACTERIZATION STUDIES IS PRESENTLY OWNED BY LEAF RIVER FOREST PRODUCTS, A COMPANY THAT PROCESSES TIMBER. WILL THE WITHDRAWAL OF THE LAND BY THE FEDERAL GOVERNMENT HAVE AN IMPACT ON NEKOOSA AND PERRY COUNTY? THIS MUST BE CONSIDERED.

ALSO, WILL OTHER INDUSTRIES, PRIMARILY TIMBER RELATED, WANT TO ENTER OUR AREA WHERE A REPOSITORY IS LOCATED?

AMERICANS HAVE ALWAYS BEEN ADVENTURESOME AND HAVE LOOKED FOR ANSWERS TO QUESTIONS. THE ATTITUDE IS WHAT HAS MADE EXPLORATION TECHNOLOGY AND PRODUCTION OF NATURAL RESOURCES A COMMONPLACE FACT OF LIFE IN THIS COUNTRY. THERE IS NO REASON TO BELIEVE THAT FUTURE GENERATIONS OF THE INHABITANTS OF THIS AREA WILL BE MUCH DIFFERENT.

THE BEST MINDS IN THIS WORLD CANNOT PREDICT WITH ABSOLUTE ASSURANCE THE CHARACTERISTICS OF SOCIETIES THAT WILL RESIDE IN ANY AREA OF NORTH AMERICA HUNDREDS OF YEARS FROM NOW.

STUDIES HAVE BEEN PERFORMED TO DETERMINE THE MARKINGS THAT ARE NEEDED TO WARN FUTURE GENERATIONS OF THE PRESENCE OF NUCLEAR WASTE. MOST PEOPLE TODAY CANNOT READ OLD ENGLISH WHICH IS APPROXIMATELY 500 YEARDS OLD CAUSING CONCERN THAT NO ONE WILL BE ABLE TO READ THE 1985 LANGUAGE 10,000 TO 100,000 YEARS FROM NOW. WE CANNOT ASSUME THAT THE GEOLOGICAL EXPLORATION RECORDS THAT ARE AVAILABLE TODAY WILL BE AVAILABLE IN SEVERAL HUNDRED YEARS.

WE CANNOT IGNORE THE FACT THAT THE SALT DOME WILL STILL BE HERE THOUSANDS OF YEARS FROM NOW. CURIOSITY MAKES THE SALT DOME A PRIME TARGET FOR FUTURE HUMAN INTRUSION. THAT ISSUE WEIGHS HEAVILY IN ANY DISCUSSION OF THE DEPARTMENT OF ENERGY THAT COULD RESULT IN A SALT DOME BEING NOMINATED FOR A REPOSITORY.

MOST SALT DOMES ARE AT LEAST PARTIALLY COVERED BY CAPROCK. WE HAVE BEEN TOLD THAT THE CAPROCK SERVES TO PROTECT THE DOME

FROM FURTHER RAPID DISSOLUTION. WE WOULD SUSPECT THAT TO BE THE CASE IF THE CAPROCK IS SOLID AND MAKES SOLID CONTACT WITH THE SALT.

DATA WE HAVE SEEN FOR THE RICHTON DOME INDICATES THAT THE SALT CAPROCK CONTACT IS NOT TIGHT AND THAT SECTIONS OF THE CAPROCK ARE SOMETHING LESS THAN SOLID. IF SITE CHARACTERIZATION WERE EVER TO BE PERFORMED AT THE RICHTON DOME, THE CAPROCK GEOLOGY AND HYDROLOGY MUST BE EXTENSIVELY EXAMINED. WE ALSO AGREE WITH MR. M. KEHNEMUYI IN HIS "REVIEW AND RESPONSE TO USGS, STATES OF MISSISSIPPI, LOUISIANA AND TEXAS COMMENTS ON ONWI-109" WHEN HE STATES, (QUOTE) "MY PERSONAL FEELING IS THAT USGS IS CORRECT IN ITS STATEMENT THAT WE WILL NOT BE ABLE TO CHARACTERIZE THE DOME FLANKS AND THE CAPROCK TO ASSESS THE HYDROLOGIC FLOWS AND SHORT-CIRCUITING PATHWAYS FROM THE REPOSITORY TO THE ACCESSIBLE ENVIRONMENT...THE ONLY SOLUTION TO THIS PROBLEM THAT MAY BE ACCEPTABLE BY NRC IS TO ASSUME INSTANTANEOUS OR VERY RAPID FLOW THROUGH THE FLANK,, PROVIDED THE HYDROSTATIC HEAD PERMITS SUCH A VERTICAL FLOW, AND THEN TO ASSESS THE **RADIONUCLIDE TRANSPORT** TIME NOT WATER TRAVEL TIME FROM THE TOP OF THE CAPROCK TO THE ACCESSIBLE ENVIRONMENT. IF THIS CALCULATION INDICATES ACCEPTABLE DOSES AT THE ACCESSIBLE ENVIRONMENT THEN THE DOME WOULD QUALIFY; OTHERWISE IT WOULD DISQUALIFY AS A REPOSITORY SITE. THE PRIMARY REASON WHY I BELIEVE WE WILL NOT BE

ABLE TO CHARACTERIZE THE GEOHYDROLIC CONDITION OF THE DOME FLANK AND THE CAPROCK IS THE SIZE OF THE SURFACES THAT NEED TO BE EXPLORED. FOR EXAMPLE, THE PERIPHERY OF RICHTON DOME AT 2000 FEET BELOW GROUND SURFACE IS APPROXIMATELY 14 MILES, WHICH PROVIDES A DOME FLANK SURFACE AND CAPROCK AREA OF APPROXIMATELY 10 SQUARE MILES. CHARACTERIZATION OF AN IRREGULAR SURFACE OF 10 SQUARE MILES AT A DEPTH OF 800 FEET TO 2000 FEET IS DIFFICULT IF NOT IMPOSSIBLE."(END QUOTE). THEREFORE, AN ADEQUATE AND HONEST EVALUATION CANNOT BE MADE ON THE RICHTON DOME

WATER FLOWING ALONG THE SALT-CAPROCK IS THE WATER THAN FLOWS DIRECTLY UNDER OUR COMMUNITY. IF THAT WATER SHOULD EVER BECOME CONTAMINATED, WE WOULD BE THE FIRST TO SEE THE IMPACT. THE USGS ALSO DISAGREES WITH THE DEPARTMENT OF ENERGY IN THAT USGS SAYS THAT THE WATER- FLOW RATE AT THE RICHTON DOME COULD RELEASE RADIONUCLIDES INTO THE ACCESSIBLE ENVIRONMENT AS SOON AS 110 YEARS RATHER THAN 10,000 YEARS AS IS REQUIRED. THIS MUST BE FURTHER ADDRESSED.

THE DOE DID A TOTALLY INADEQUATE JOB OF ADDRESSING TRANSPORTATION. THE ROUTES AND MODES OF TRANSPORTATION HAVE NOT BEEN UPDATED IN THE LAST EIGHT YEARS. OUR EXISTING ROAD CONDITIONS ARE IN CONSTANT NEED OF REPAIRS. IT WOULD PLACE A FINANCIAL BURDEN ON THE COUNTY TO HAVE ADDED COST OF ROAD REPAIRS BROUGHT ABOUT BY SUCH A LARGE FACILITY.

WE FEEL THAT THE REASON FOR RANKING RICHTON AS NUMBER ONE FOR TRANSPORTATION HAS BEEN LARGELY MADE ON OUR BEING CLOSER TO

THE POINT OF GENERATION OF THE WASTE. OTHER COST FACTORS HAVE NOT BEEN ANAYZED.

AS STATED ON PAGE 15 OF THE DRAFT EA "THERE ARE RADIOLOGICAL RISKS, WHICH WOULD RESULT FROM THE DIRECT EXTERNAL RADIATION EMITTED BY THE RADIOACTIVE WASTE AS A SHIPMENT PASSES BY." THE TOTAL NUMBER OF TRUCK SHIPMENTS OF NUCLEAR WASTE WILL BE 9,000 BY THE YEAR 2000 OR ONE TRUCK PER HOUR ARRIVING AT THE REPOSITORY. FOR THIS REASON THE REPOSITORY SITE WOULD BECOME "THE END OF THE TRAMSPORTATIOM FUNNEL;" AND VULNERABILITY TO POSSIBLE TRANSPORT-SYSTEM BOTTLENECKS, THE PEOPLE NEAR THE SITE, FOR EXAMPLE, THE TOWN OF RICHTON, WILL BE EXPOSED TO GREATER RELEASES OF RADIATION. THIS SITUATION HAS NOT BEEN ADEQUATELY ADDRESSED.

NUMEROUS STUDIES HAVE BEEN CONDUCTED OVER THE YEARS BY UNIVERSITIES, PRIVATE FIRMS AND INDEPENDENT SCIENTISTS WHICH HAVE BEEN COMPLETELY AND SELECTIVELY OVERLOOKED BY THE DOE.

THE ONLY INFORMATION THAT THE DOE ACCEPTS IS A CONTRIBUTION BY SUBCONTRACTORS. THESE SUBCONTRACTORS GENERATE CONSISTENTLY ONLY INFORMATION WHICH CONFORMS TO DOE GUIDELINES.

A FATAL FLAW WHICH PERMEATES THE PROGRAM IS THE OBVIOUS CONFLICT OF INTEREST AMONG SUBCONTRACTORS. A CONTRACT OF THIS MAGNITUDE WILL BE TENACIOUSLY SOUGHT BY THE SUBCONTRACTORS. THE MORE FAVORABLE A SITE IS PORTRAYED BY A FIRM, INEVITABLY THERE

WILL BE SUBSEQUENT, LUCRATIVE CONTRACTS AWARDED TO FURTHER INVESTIGATE THE SITE.

WE REMAIN VEHEMENTLY OPPOSED TO THE SELECTION OF THE RICHTON DOME AS A NUCLEAR WASTE REPOSITORY BASED UPON THE DOE'S LIBERAL AND INHERANT UNCERTAINTIES AND POTENTIALS. THERE SHOULD HAVE BEEN ONLY SITE SPECIFIC DATA USED. OFFSITE, GENERIC AND STATE-OF-THE-ART DATA ARE NOT ADEQUATE.

DESPITE THE SUBMISSION OF 2,100 PLUS COMMENTS FROM MISSISSIPPI ALONE, NO SUBSTANTIAL REVISIONS HAVE BEEN MADE. THIS LEADS ONE TO CONCLUDE THAT DOE'S ONLY OBJECTIVE IN SEEKING COMMENTS ARE TO FULFILL THE LETTER OF THE LAW AND NOT THE INTENT.

THE LATEST CRUCIAL ISSUE TO BE DROPPED ON THE POTENTIAL SITES IS DOE'S APPARENT NEW METHODOLOGY IN MAKING SITE SELECTIONS. AS OF OCTOBER 21, 1985 DOE HAS NO PLANS TO ALLOW THE AFFECTED STATES TO PARTICIPATE IN THE APPLICATION OF THE REVISED METHODOLOGY. THIS EQUATES TO CHANGING THE HORSE IN THE MIDDLE OF THE STREAM.

THANK YOU FOR THE OPPORTUNITY TO APPEAR BEFORE YOU TODAY.

I RESPECTFULLY REQUEST THAT YOU GIVE CAREFUL ATTENTION TO THOSE MATTERS I HAVE DISCUSSED IN BOTH THIS AND MY ATTACHED STATEMENT, AND I WILL BE HAPPY TO SUPPLEMENT OR AMPLIFY ANY OF THESE POINTS IF YOU SO DESIRE.

JET
THE J. ED TURNER COMPANIES

J. ED TURNER, INC.
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19 PROFESSIONAL PARKWAY • P. O. BOX 1707 • HATTIESBURG, MISSISSIPPI 39401
DIAL AREA CODE 601-268-7900

REALTOR®

July 12, 1983

Mr. Cleve Harrington
P. O. Box 111
South 23rd Avenue, #30
Hattiesburg, MS 39401

Dear Mr. Harrington:

We appreciate you contacting our firm concerning the listing of your property in Richton, Mississippi. At this time we find it somewhat difficult to market property in this area.

There are several factors that influence our lack of success in marketing property in this area. One is the reluctance of the buyers to purchase property in this area until such time as the location of the waste site is resolved. This is a general reaction we have received from some of our customers and does not represent the view of our firm nor does it represent our opinion of value.

We appreciate your contacting our firm concerning this listing. If we can be of service to you in the future, please contact us.

Sincerely,

J. ED TURNER, INC.

MIKE GARVEY, OFFICE MANAGER

MG:ss

J. ED TURNER MEMBER: AMERICAN SOCIETY OF REAL ESTATE COUNSELORS; SOCIETY OF INDUSTRIAL REALTORS; AMERICAN INSTITUTE OF REAL ESTATE APPRAISERS; THE INSTITUTE OF REAL ESTATE MANAGEMENT; REALTORS NATIONAL MARKETING INSTITUTE; INTERNATIONAL REAL ESTATE FEDERATION; AND FARM AND LAND INSTITUTE OF THE NATIONAL ASSOCIATION OF REALTORS; MORTGAGE BANKERS ASSOCIATION; SOCIETY OF REAL ESTATE APPRAISERS.

Mississippi Environment Management Organization

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Mississippi Environment Management Organization
Comments on the Department of Energy Mission Plan

Submitted to:
Chairman Morris Udall
Subcommittee on Energy & Environment of the
House Committee on Interior & Insular Affairs
September 13, 1985

The Mississippi Environmental Management Organization would like to submit the following comments to Congress on the Mission Plan. In reference to the 30-day Mission Plan review deadline, Congress must take action immediately. Congress should further examine carefully the assertion by the DOE that "all data and decisions" involved in operating its Mission Program "are subject to review by peer review groups" as part of its commitment to both an open technical review process and to a public information program.

The Mission Plan does not satisfy the mandate of the Nuclear Waste Policy Act of 1982 which is to identify unresolved technical issues and those problems which impede implementation of the Act. We perceive the following problems:

I.) The public feels the DOE has failed to establish objective standards and mechanisms for reviewing and double-checking its judgments, thus has no confidence in the program.

There can be no public confidence in the nuclear waste program when DOE states the town of Richton, Miss. is two miles from the Richton Salt Dome when in fact one-third of the town is situated over the dome. The Mission Plan further states the town of Richton "lies adjacent to the boundaries of the control area" (pg. 357). The Richton site is unquestionably proximous to significant population concentrations and should therefore be disqualified in accordance with the population strictures established in the Nuclear Waste Policy Act of 1982.

II.) The socio-economic impacts are so complex that they cannot accurately be predicted.

The Mission Plan statements relative to socio-economics bear little resemblance to the caricature of socio-economic activities actually undertaken by DOE. The Mission Plan purports

". . . it is of the utmost importance that the potential for socio-economic impacts be assessed in a thorough and timely manner, with adequate planning to avoid, minimize, or mitigate any negative impacts." (pg. 137) Yet, funding is denied to the state of Mississippi to accomplish this. No creditable mechanism to avoid, minimize, or mitigate negative impacts has been suggested. There is a pronounced inclination on the part of the Dept. of Energy expressed in the Mission Plan to evade socio-economic issues. Nor do they avail themselves of accumulated social science expertise. There is flagrant denial of the extent of likely negative impacts, yet possible positive impacts are emphasized. The nearby National Forest, water, and mineral resources of the area are also in danger of being adversely affected. Land values in the area have already been impacted.

III.) Camp Shelby, a vitally important military post, stands to be adversely impacted by any mining operations at Richton Dome.

Recently, Camp Shelby accepted 4500 refugees during Hurricane Elena. It can presently handle 10,000 military personnel (91,000 military personnel were trained there during 1984). It is used year round for National Guard Army reserve, and active military training.

Camp Shelby has been officially designated as a major mobilization center for the 2nd Army (of which there are only four) by the U.S. Secretary of Defense. Camp Shelby has been further designated as the National Guard Fielding Site for the M-1 Tank and the Bradley Fighting Vehicle. The C.S. Air-2-2 Ground Bombing Range is actively used by the U.S. Air Force, the U.S. Navy, and the Air National Guard. Major upgrading plans have been approved. Air space over Richton and Cypress Creek Domes are restricted from commercial use.

IV.) The subsurface hydrology cannot easily be predicted.

The Department of Energy continues to rank the Richton site quite high despite its pristine pure lack of information concerning subsurface hydrology. The Mission Plan's hydrologic studies section on salt is inferior in detail and content to that of basalt and tuff. The discussion of radionuclide release paths omits mention of short-circuit pathways. Plausible pathways overlooked are: vertical movement up a shear zone in the dome, horizontal connection along a shear zone to surrounding sediments, salt-caprock interface over the dome, faulting within the caprock allowing connection with overlying aquifers, vertical movement up the dome - sediment interface on the flanks of the dome, vertical movement up improperly sealed shafts or boreholes. The assumption that releases occur at depth is not valid for all plausible release scenarios; for example, hydrostatic pressures at depth after closure due to water infiltration and heating which would force fluids upward through various pathways.

DOE acknowledges the possible existence of near-dome pathways "along the dome sheath or along faults", but simply states that "the data needed to define these potential pathways is not available." DOE fails to factor such potential problems into their analyses of a release scenario.

V.) Knowledge is limited on the chemical and geothermal effects of nuclear waste on the geological environment.

DOE [illegible] the ability [illegible] show [illegible] site. For example, [illegible] creep associated with salt host rock, maintenance [illegible] would be required to assure the retrievability of the [illegible].

DOE only gives eight months on in-situ testing in salt, which is less than that for basalt or tuff. They fail to adequately address the impact of drilling large diameter shafts through water-bearing strata.

Questions arise concerning seal-performance testing. There are no assurances in the Mission Plan that before shaft construction commences there will be adequate shaft sealing at a salt dome site overlain by unconsolidated, water-bearing sediments.

VI.) The DOE did not monitor seismicity in the Permian Basin Areas during site screening, and falsely stated that the area was seismically inactive.

The truth is that there are two areas of ongoing earthquake activity in southern Mississippi, one to the northeast and one to the south of the two candidate salt domes in Perry County. The lack of recorded earthquakes in the immediate vicinity of the domes may be due to the lack of instruments in the area rather than a lack of ongoing microseismicity. Any site under consideration for a repository should have a long established record of seismic monitoring.

VII.) There is intense disagreement on the health risks of low level exposure.

Due to the latency involved in the existence of health effects, the health risks imposed upon neighboring populaces has not been adequately assessed. Exposure to ionizing radiation produces biochemical alterations in cells leading to inherited birth defects and cancers. The effects of radiation are greatest in the young and in their rapidly growing tissues. Exposure of an unborn child to radiation has been shown to increase the incidence of death from cancer before age 10 by 50%. The effects of low level exposure to radiation are cumulative, and produce effects which may not show for many years. Health physicists state that there are no absolutely safe low levels of exposure. British dockyard workers exposed to levels of radiation well within safety standards have been found to have increased rates of chromosomal aberrations. Despite government assurances of safety, the residents of Nevada and Utah who were exposed to radioactive fallout from the 1957 above-ground nuclear weapons tests have experienced greatly increased incidence of leukemia.

The Environmental Protection Agency cannot develop an "individual dose standard"; and a "population standard" alone is totally unacceptable.

VIII.) A transportation system that can handle 9000 shipments of high level nuclear waste per year (or one shipment per hour) to a repository has yet to be feasibly developed.

There is yet to be demonstrated a method to measure and project permissible levels of exposure to populaces involved in the transportation of the waste. The potential for widespread levels of excessive exposure is exponentially enhanced with the prospect of transporting wastes. This hazard is acute in the event of transportation mishaps.

The Mission Plan states the DOE views the Monitored Retrievable Storage as an integral part of a waste disposal system. The dry storage method is to be approved for Virginia Power this September. Dry Storage appears to be preferable because it does away with transporting waste which enhance the risk factor.

The Mission Plan states that the MRS is more cost effective than the dry storage method. MRS, however also requires, a facility and transportation cost which should enter into the cost analysis.

IV.) The prevention of human intrusion through institutional management for thousands of years is unrealistic.

Evaluation of mineral resources is an attempt to ". . . reduce or remove the incentives for economically motivated post-closure human-interference capabilities of the site. (Federal Register, vol. 49, no. 236, Dec. 6, 1984, sec. 960, 4/2/8/1). The Mission Plan's analysis of the economic mineral resources of salt sites is based on present economic conditions. The Mission Plan should consider future economic trends of resources presently identified at the site. For example, 100 ft. of asphaltic oil encountered at Richton may be recovered in the future as oil supples dwindle and technology improves. Ground Water, sited as a mineral resource, as well as sand and gravel, should be included in an analysis of future trends of predicting the probability of intrusion.

In conclusion, before additional billions of tax dollars which the nation can ill afford are expended, MEMO urges the disqualification of the Richton site as a candidate for a permanent nuclear waste repository.

Respectfully submitted,

Carol Mann
Carol Mann
MEMO Public Information Officer

Carolyn Blackman
MEMO Nuclear Waste Chairperson

Alisha Fergason
Alisha Fergason
MEMO Corresponding Secretary

Susan Purdy
Susan Purdy
MEMO Board of Directors

Vicki Harrell
Vicki Harrell
MEMO Board of Directors

Donald Finn
Donald Finn
Manhattan Group

BEFORE THE

SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

STATEMENT OF DELBERT DEVIN

REGARDING THE NUCLEAR WASTE REPOSITORY PROGRAM

October 30, 1985

Mr. Chairman and members of the Committee, thank you for giving me this opportunity to testify.

My name is Delbert Devin. I am president of STAND, Inc. (Serious Texans Against Nuclear Dumping), a citizens group in Swisher County, Texas. I have been a farmer all my life except for my service as an Air Force navigator in the Far East during World War II and brief service as a teacher at Texas Tech University. Some of my farmland is within the DOE's Swisher County site.

I am here today representing STAND and also POWER, Inc. (People Opposed to Waste Energy Repositories), the Deaf Smith County organization of citizens and the landowners on the proposed DOE site. I wish to briefly address the many issues raised in the letter of invitation to this hearing, based on the experience of STAND and POWER. I would note, however, that in talking with people from other affected first and second round states over the past few years the concerns we have are shared by people in many other places.

STAND was actively involved in the federal government's nuclear waste program even before the passage of the Nuclear Waste Policy Act (NWPA). STAND and POWER believe that our responsibility to present and future generations requires a careful, technologically sound solution to the nuclear waste problem. Hasty, politically motivated decisions by the DOE will never solve a problem of this gravity - we will not accept anything less than the best possible solution. Although we have participated at every opportunity in the process, including hiring an attorney and a technical advisor and submitting technical comments at times that the DOE didn't ask for them, we have seen no change in the DOE decisionmaking since the passage of the NWPA. Therefore, we have concluded that the DOE efforts are as fatally flawed now as they were prior to the passage of the Act and that it is up to Congress to require changes necessary for a scientifically sound, publicly acceptable program.

I will discuss the basis for this conclusion in more detail in this testimony. As requested in the invitation letter, I will discuss the site selection process, the EPA repository standards, and the NRC licensing role.

SITE SELECTION PROCESS

From our personal experiences, we know that Congress' finding in the Nuclear Waste Policy Act (NWPA) was true -- "Federal efforts during the past 30 years to devise a permanent solution to the problems of civilian radioactive waste disposal have not been adequate." (Section 111(a)(3)) However, DOE chooses to interpret the Act as "grandfathering" all of the sites it had selected prior to the passage of the law, including the two sites in the Texas Panhandle which were not finally selected until November 27, 1984 — 23 months after Congress passed the law!

We certainly believe that the congressional intent in requiring a different process (including guidelines, nomination, recommendation, presidential determination of sites to be characterized, state veto, and congressional override) than that previously used was that new sites be considered for the first repository. If our understanding of the congressional intent is correct, then DOE has totally abused and circumvented the law and Congress should act to stop DOE. On the other hand, if the congressional intent was to let DOE proceed with the same unsuitable sites, then Congress must now change the law because the program will not lead to selection of technically sound sites and certainly not have a repository operating by 1998.

In Texas, DOE preliminarily selected two locations, totalling almost 500 square miles in December 1982, and did not finalize this decision until its Location Recommendation Report of September 27, 1983. The two nine-square mile sites were not identified until November 27, 1984, approximately three weeks before the draft environmental assessments were released. Thus, DOE's hearing in April 1983, which the department says fulfilled the requirements of Section 112(b)(2) of the NWPA, occurred prior to any landowners knowing where the site would be located. Thus, the residents of Vega, Texas, the area closest to the Deaf Smith site, did not attend the 1983 hearings because they had no idea that their land would be affected. In fact, none of the affected landowners were contacted by DOE until March 1984 and some of them were not contacted until November 30, 1984. Thus, DOE clearly did not comply with the intent of Section 112(b)(2) that hearings be held "in the vicinity of such site to inform the residents of the area in which such site is located of the proposed nomination of such site and to receive their comments." Because DOE never received the comments of these people until the EA hearings in late February 1985, they made many fundamental mistakes regarding the sites in Deaf Smith and Swisher counties. A technically sound program would have eliminated these sites.

Unsuitable sites in Texas

For the draft environmental assessments (EAs) on the Deaf Smith and Swisher county sites, STAND and POWER submitted 98 pages of written comments plus 16 pages of supporting documents, in addition to oral testimony given by dozens of people during three days of hearings. Given the limited time, I can today only mention some of the major problems with the sites and the draft EAs.

1) Ogallala and Santa Rosa aquifers. Both sites are below the nation's largest underground aquifer, the Ogallala, which is essential for drinking and irrigation water for people in eight states. Any contamination of the aquifer would affect not only people in Texas, but people in other states directly and through possible contamination of the food chain people throughout the nation

and even in countries receiving exported food from the area. To even attempt to site a nuclear waste repository underneath such an important aquifer is the height of insanity.

We do not believe that site characterization can even be accomplished without degredation or contamination of the Ogallala or the Santa Rosa, a deeper yet very large, aquifer. The freezing technology suggested by DOE for shaft sinking has never been done in the Ogallala, and we do not believe it has been successfully done any place in the country or the world for two aquifers of the size and flow of the Ogallala and Santa Rosa. In addition to the technical impossibility of successfully sinking the shafts without depleting or contaminating the aquifers, we do not believe that DOE and its contractors can meet the permitting requirements of the State of Texas to sink the shafts. Therefore, we do not believe that DOE can obtain the necessary permits to even begin site characterization in Texas.

DOE seems to have little fundamental concern about the aquifers or the people who depend on their water because DOE believes that the aquifers are being depleted and that few people will live in the area in 2020 or 2030 when repository operation would cease. Once again, DOE is seriously mistaken. I and my parents have farmed without irrigation in the past and will do so in the future if necessary. Moreover, depletion is not what DOE says. For example, the largest well within the Deaf Smith County site is in the Santa Rosa aquifer and is owned by Wayne Richardson. As Mr. Richardson testified at the EA hearing of February 28, 1985, in 8 years of very substantial use, the water level has dropped 3 feet, with 236 feet of water remaining. Moreover, during 1984, 602 acre feet of water was pumped from the well and the water level rose one foot. Clearly, there is a very large recharge area on the site. This fact indicates that DOE's "fact" that irrigated agriculture cannot continue for a long time at the site is wrong. More critically from a geologic standpoint, it shows that DOE has no understanding of the hydrology of the site or in the region, since DOE believes that there is little or no recharge at all.

During the last month in Swisher County, we have had over a foot of rain at the site. The playa lakes which DOE believes to be small, became very large, flooding fields and adjacent roads. Despite DOE's claims to the contrary, flooding of the surface facilities at the site is very likely. Moreover, Wayne Wyatt, Manager of the High Plains Underground Water District No. 1, believes that the playa lakes provide some of the recharge to the Ogallala. Once again, DOE's assumptions are inaccurate.

2) Agricultural economy. The two sites proposed by DOE are in some of the best agricultural land in the country -- more than 80 percent is prime farmland. More than 80 percent of the world's hybrid grain sorghum production comes from this area because of its unique climate, altitude, soil conditions, and water supply. In addition, other seed production, crops, and livestock come from this area. Deaf Smith County is one of the top agricultural production counties in the nation. Arrowhead Mills, one of the nation's largest natural food companies; Frito Lay; and Holly Sugar all have large operations in Hereford. Officials from these companies have stated that having a repository in the area, whether or not there was ever any contamination, would likely cause them to close their operations. The possibility of an operational and transportation release is too much of a risk.

The Richardson Seed Company, which owns and uses the Santa Rosa well within the site, is a unique family operation which cannot be moved or operated alongside of a nuclear waste site. During 1984, the Texas

Agriculture Experiment Station (TAES) winter wheat varieties maintained only at Richardson's accounted for more than 7 million acres of wheat production valued at over $1 billion.

The food produced at the site and in the area now and for future generations is too important to risk any contamination from a repository. Prime farmland with important ground water supplies should be disqualified from being considered for a repository.

3) Other problems. Other deficiencies of the sites include inadequate salt thickness with many non-salt interbeds, severe socioeconomic impacts including the condemnation of the Santa Rosa well which is the town of Vega's only long-term water supply, faulting near the sites, mineral resources near and possibly underneath the sites, surface contamination of prime farmland outside of the site caused by blowing salt, and numerous transportation problems. The fact that DOE fails to recognize all of these factors related to the unsuitability of the sites seems to be based on two problems. First, DOE wants to proceed with the program even though it does not have suitable sites in Texas or elsewhere. Second, DOE depends upon its contractor "experts" who know little or nothing about the sites, rather than getting its information from the real experts -- residents, agricultural companies, the Underground Water District and other in-state ground water experts.

It is essential to note that the adverse impacts on the aquifers and the agricultural economy will occur with land condemnation and site characterization. The unsuitability of the Texas sites requires that they be excluded from site characterization.

EPA ENVIRONMENTAL STANDARDS FOR REPOSITORIES

STAND and POWER were hopeful that EPA would recognize the importance of protecting major ground water resources, despite DOE's lack of concern.

Unfortunately, EPA's final standards, published in the Federal Register on September 19, provide no protection for the Ogallala and Santa Rosa aquifers. EPA's definition of Class I ground waters is so narrow that it is useless as a criteria for ground water protection from nuclear waste repositories. Therefore, it is clear to STAND and POWER that these standards are fundamantally inadequate.

STAND and POWER strongly believe that ground water resources, both in Texas and other parts of the nation, must be protected. We believe, however, that states are better able than EPA to develop plans and protect ground water. Therefore, EPA's classification system in the Ground Water Protection Strategy published in August 1984 should not be applied to the repository standards.

NRC LICENSING

NRC's involvement in site characterization and licensing is critical to requiring that technically adequate sites are selected. However, the 27 month timetable established in the DOE Mission Plan for NRC to complete approval of the construction license application is entirely too short to allow for adequate citizen and state participation. If NRC agrees to such a short timeframe it will substantially undermine its credibility as a protector of public health and safety regarding repositories.

STAND actively participated in the NRC concurrence process on DOE's guidelines, and the record indicates that our comments had some impact. The organizations believe that it is essential that all aspects of NRC's pre-licensing and licensing procedures should be fully available to the public and that affected citizen groups like STAND and POWER.

CONCLUSION

I do not believe that the nuclear waste program that DOE is conducting will result in safe permanent repository sites. In meetings and discussions with people in other first and second round states during the past three years, I know that those with direct experience with DOE in the other states have developed the same attitude. The DOE program is clearly technically flawed. Members of STAND and POWER will continue fighting to safeguard our land and water and to require that the federal government's waste management program be technically sound and seek the best possible sites. I am confident that citizen groups in other first and second round states will act similarly.

STAND and POWER request that Congress seriously consider our concerns and require fundamental changes in the waste program.

Thank you again for allowing me to testify.

MATERIAL SUBMITTED BY PAUL CRAWFORD, COMMONSENSE COALITION

THE MISSION OF THE NATIONAL ATOMIC AND TECHNOLOGICAL ADMINISTRATION

In carrying out a policy of Congress that activities on earth should be devoted to peaceful purposes for the benefit of all humankind, the principal statutory functions of the National Atomic and Technological Administration (NATA) are to conduct research for the solution of problems of nuclear contamination within the earth's atmosphere, terra firma and waters, and develop, construct, test and operate atomic counter-reactors and re-reactors and other technological advancements; conduct activities required for the neutralizing or re-using of nuclear wastes and other hazardous or toxic wastes; arrange for the most effective utilization of the scientific, technological and engineering resources of the United States with other nations engaged in atomic and other scientifically-applied activities for peaceful purposes; and to provide for the widest practicable and appropriate dissemination of information concerning NATA's activities and their results.

MICHAEL L. STRANG
3D DISTRICT, COLORADO

INTERIOR AND INSULAR AFFAIRS COMMITTEE
SUBCOMMITTEES:
ENERGY AND THE ENVIRONMENT
PUBLIC LANDS
WATER AND POWER RESOURCES

Congreſs of the United States
House of Representatives
Washington, DC 20515

WASHINGTON OFFICE
ROOM 1331
LONGWORTH HOUSE OFFICE BUILDING
202-225-4761

DISTRICT OFFICES:
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PUEBLO, CO 81003
303-543-7572

FEDERAL BUILDING
400 ROOD AVENUE
ROOM 128
GRAND JUNCTION, CO 81501
303-242-2400

April 26, 1985

The Honorable Morris K. Udall
Chairman
House Committee on Interior
  and Insular Affairs
1327 LHOB
Washington, DC 20515

Dear Mo:

We are writing to request the scheduling of a public hearing in Washington, D.C., before the Energy and Environment Subcommittee regarding the transportation of nuclear wastes in conjunction with the selection of a permanent disposal site for high-level nuclear wastes.

In response to the provisions of the Nuclear Waste Policy Act of 1982, the Department of Energy has selected three sites for continued "characterization" studies. One of those sites is expected to be selected for the permanent depository. The three final candidate sites are located in Nevada, Washington and Texas.

We are concerned about the transportation of these high-level nuclear materials to whichever site is finally chosen. A number of local government officials and citizens have expressed considerable concern about the safety of transporting these hazardous materials over the Interstate highway system and other roads or rail lines through populated and environmentally sensitive areas of Colorado.

As you know, both I-70 and I-25 are the major highway transportation corridors through Colorado. Obviously, they are clear candidates for these nuclear waste transportation corridors. There are serious concerns that need to be examined and discussed regarding railroad and/or truck routes. For example, under State law, trucks carrying these materials would not be allowed to travel through the Eisenhower Tunnel portion of I-70. Instead, the vehicles would have to negotiate a narrow and winding road over 12,000 foot Loveland Pass. It would be a most hazardous trip.

Also, a 13 mile stretch of I-70 passes through Glenwood Canyon. That narrow, winding highway and rail line are just a matter of feet from the Colorado River throughout its length. Of course, on I-25, the nuclear wastes would have to travel through Pueblo, Colorado Springs, Denver or Fort Collins, the largest population centers in Colorado. In addition, there is a particularly hazardous section of I-25 called Monument Hill, between Colorado Springs and Denver. That portion of the highway is extremely treacherous during the winter and other times of inclement weather.

We believe the transportation of nuclear wastes to the permanent disposal sites is a significant issue that should be addressed as part of the ongoing environmental assessments pertaining to the sites. For these reasons, we respectfully request that a hearing be called to provide an opportunity for us to discuss the issues with concerned citizens and officials of the Departments of Energy and Transportation.

Thank you for your consideration. We look forward to working with you regarding this important issue.

With best wishes,

Sincerely,

Hank Brown
Hank Brown
Member of Congress

Michael L. Strang
Member of Congress

Ken Kramer
Ken Kramer
Member of Congress

Dan Schaefer
Member of Congress

Pat Schroeder
Member of Congress

Tim Wirth
Timothy E. Wirth
Member of Congress

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JOE BARTON, TEXAS

COMMITTEE ON INTERIOR
AND INSULAR AFFAIRS
U.S. HOUSE OF REPRESENTATIVES
WASHINGTON, DC 20515

STANLEY SCOVILLE
STAFF DIRECTOR
AND COUNSEL

ROY JONES
ASSOCIATE STAFF DIRECTOR
AND COUNSEL

LEE McELVAIN
GENERAL COUNSEL

RICHARD AGNEW
CHIEF MINORITY COUNSEL

August 2, 1985

The Honorable Michael L. Strang
United States House of
Representatives
1331 Longworth House Office Building
Washington, D.C. 20515

Dear Mike:

This is in response to your letter of April 26 concerning the transportation of high-level radioactive waste.

I understand your concern about the transportation routes under consideration by the Department of Energy in its analysis of potential repository sites. A number of my colleagues and the states which they represent believe that some of the routes most likely to be selected by the Department may not necessarily be the safest passageways for these materials. I realize that this may be particularly distressing to states such as Colorado, which will likely be within the transportation corridor regardless of which site is finally chosen for the first repository. This issue merits looking into.

I have scheduled the Subcommittee on Energy and the Environment to conduct a field hearing in Colorado on the transportation of radioactive waste in November. It is my intent that the concerns raised by the State of Colorado and other interested parties be aired at that time.

Should you have any questions regarding this hearing, please have your staff contact Joe Shorin of my staff at 225-8331.

Sincerely,

Mo

MORRIS K. UDALL
Chairman

RESOLUTION NO. 42
(Series of 1984)

A RESOLUTION OF THE ASPEN CITY COUNCIL DECLARING ITS OPPOSITION TO THE STORAGE AND TRANSPORTATION OF RADIO-ACTIVE SUBSTANCES AND OTHER HAZARDOUS MATERIALS IN THE CITY OF ASPEN AND ALONG INTERSTATE HIGHWAY I-70

WHEREAS, the City of Aspen, Colorado, is a home rule municipality existing under and by virtue of the Constitution and laws of the State of Colorado with all of the powers conferred thereby; and

WHEREAS, the City Council has received an application from the Commonsense Coalition, including Tom Benton, Maxwell Aley and Paul M. Crawford, to enact legislation declaring the City of Aspen as a "Nuclear-Free Zone"; and

WHEREAS, the City Council finds that contamination by radio-active and other hazardous substances, by accident or intent, presumptively interferes with the tourist and residential character of the City of Aspen and would have an adverse effect on the residents, visitors, businesses and wildlife in the Aspen area; and

WHEREAS, because Interstate Highway I-70 is the main ground route for visitors and inhabitants traveling to and from Aspen, the City Council also opposes the transportation of radio-active and other hazardous substances along Interstate Highway I-70; and

WHEREAS, the City Council is aware that certain court decisions have limited the ability of local governments to ban or regulate the transportation and storage of radio-active and other hazardous materials on state and federal highways; and

WHEREAS, the City Council desires to declare its opposition to the storage and transportation of radio-active and other hazardous materials in the City of Aspen and along Interstate Highway I-70, and therefore desires that the City Manager and City Attorney recommend a program for prohibiting or regulating the storage and transportation of radio-active and other hazardous materials in the City consistent with the City's legal authority in such matters.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ASPEN, COLORADO:

Section 1

The City Council of the City of Aspen, Colorado, hereby declares its general opposition to the storage and transportation of radio-active substances and other hazardous materials in the City of Aspen and along Interstate Highway I-70.

Section 2

The City Manager and City Attorney are hereby directed to develop a work program for making recommendations to determine what positive steps the City Council can take to prohibit or regulate the storage and transportation of radio-active and other hazardous substances in the City of Aspen.

Section 3

The City Clerk shall certify a copy of this resolution to the Governor of the State of Colorado, and such other local, state and federal officials, as the City Manager may deem appropriate.

Dated: November, 1984.

/s/ William L. Stirling
William L. Stirling, Mayor

I, Kathryn S. Koch, duly appointed and acting City Clerk do certify that the foregoing is a true and accurate copy of that resolution adopted by the City Council of the City of Aspen, Colorado, at a meeting held November 26, 1984.

/ss/ Kathryn S. Koch
Kathryn S. Koch, City Clerk

RESOLUTION NO. 85-7

SERIES OF 1985

A RESOLUTION OF THE AVON TOWN COUNCIL DECLARING ITS OPPOSITION TO THE STORAGE AND TRANSPORTATION OF RADIO-ACTIVE SUBSTANCES AND OTHER HAZARDOUS MATERIALS IN THE TOWN OF AVON AND ALONG INTERSTATE HIGHWAY I-70

WHEREAS, the Town of Avon, Colorado, is a home rule municipality existing under and by virtue of the Constitution and laws of the State of Colorado with all of the powers conferred thereby; and

WHEREAS, the Town of Avon has received an application from the Commonsense Coalition, Paul M. Crawford, to enact legislation declaring the Town of Avon as a "Nuclear-Free Zone"; and

WHEREAS, the Town of Avon finds that contamination by radio-active and other hazardous substances, by accident or intent, presumptively interferes with the tourist and residential character of the Town of Avon and would have an adverse effect on the residents, visitors, businesses and wildlife, in the Avon area; and

WHEREAS, because Interstate Highway I-70 is the main ground route for visitors and inhabitants traveling to and from Avon, the Town Council also opposes the transportation of radio-active and other hazardous substances along Interstate Highway I-70; and

WHEREAS, the Town Council is aware that certain court decisions have limited the ability of local governments to ban or regulate the transportation and storage of radio-active and other hazardous materials on state and federal highways; and

WHEREAS, the Town Council desires to declare its opposition to the storage and transportation of radio-active and other hazardous materials in the Town of Avon and along Interstate Highway I-70, and therefore desires that the Town Manager and Town Attorney recommend a program for prohibiting or regulating the storage and transportation of radio-active and other hazardous materials in the Town consistent with the Town's legal authority in such matters.

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF AVON, COLORADO:

Section 1. The Town Council of the Town of Avon, Colorado, hereby declares its general opposition to the storage and transportation of radio-active substances and other hazardous materials in the Town of Avon and along Interstate Highway I-70.

Section 2. The Town Manager and Town Attorney are hereby directed to develop a work program for making recommendations to determine what positive steps the Town Council can take to prohibit or regulate the storage and transportation of radio-active and other hazardous substances in the Town of Avon.

Section 3. The Town Clerk shall certify a copy of this resolution to the Governor of the State of Colorado, and such other local, state and federal officials, as the Town Manager may deem appropriate.

INTRODUCED, READ, PASSED, AND ADOPTED at a regular meeting of the Council of the Town of Avon, Colorado, held on February 12, 1985.

TOWN OF AVON, COLORADO

Allan R. Nottingham, Mayor

ATTEST:

Patricia J. Doyle

Patricia J. Doyle, Town Clerk

I, Patricia J. Doyle, duly appointed Town Clerk do certify that the foregoing is a true and accurate copy of that resolution adopted by the Town Council of the Town of Avon, Colorado, at its meeting held February 12, 1985, 1985.

Patricia J. Doyle

Patricia J. Doyle, Town Clerk

Mr. Crawford:
Attached is the executed Resolution passed by our Town Council.

TOWN OF BRECKENRIDGE
P. O. BOX 168
BRECKENRIDGE, CO 80424

3

RESOLUTION NO. 10

SERIES 1985

A RESOLUTION STATING THE TOWN OF BRECKENRIDGE'S OPPOSITION TO TRANSPORTATION OF HAZARDOUS MATERIALS ALONG THE I-70 CORRIDOR

WHEREAS, the Town of Breckenridge, Colorado, is aware of the dangers the shipping of radioactive nuclear waste and other hazardous materials across the I-70 corridor, and

WHEREAS, the potential danger is increased by the adverse weather conditions and steep grades along I-70, and

WHEREAS, any accident has the potential of contaminating not just the immediate area, but all of Summit County, and

WHEREAS, in the best interest of the citizens and visitors to Breckenridge, the Town wishes it known that it is opposed to the transportation of radioactive waste and other hazardous materials along this route; and

WHEREAS, a more practical solution for the disposal of radioactive nuclear waste is permanent entombment near the sites where it has been used;

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF BRECKENRIDGE, COLORADO, that the Town Council of the Town of Breckenridge opposes the shipment of radioactive nuclear waste and other hazardous materials across Interstate 70.

RESOLUTION ADOPTED AND APPROVED THIS 26th day of March, 1985.

ATTEST:

Rosemary Ahern

Rosemary Ahern, CMC, Town Clerk

TOWN OF BRECKENRIDGE

Stephen C. West, Mayor

APPROVED IN FORM

2-26-85

Town Attorney Date

Town of Crested Butte
P.O. Box 39
Crested Butte, Colorado 81224
—A National Historic District—
Phone: (303)349-5338

Mr. Crawford,

Enclosed please find the dated and signed copy of our Town Council's Resolution No. 1, Series 1985; "Nuclear Free Zone".

RESOLUTION NO. 1
SERIES 1985

A RESOLUTION DECLARING THE TOWN OF CRESTED BUTTE BE A NUCLEAR FREE ZONE, AND STATING THE OPPOSITION OF THE CRESTED BUTTE TOWN COUNCIL TO THE STORAGE AND TRANSPORTATION OF NUCLEAR WASTE AND OTHER RADIO-ACTIVE SUBSTANCES WITHIN THE STATE OF COLORADO.

WHEREAS, the main economic support for the Town and citizens of Crested Butte comes from the tourism industry, and

WHEREAS, the Town Council finds that the contamination by radio-active substances, by accident or intent, presumptively interferes with the tourist and residential character of the Town of Crested Butte, and would have an adverse effect on the residents, visitors, businesses and wildlife in the Crested Butte area, and

WHEREAS, the transportation and storage of nuclear waste and other radio-active and/or nuclear materials within the State of Colorado would tend to reduce the desirability of Colorado as a tourist destination, and

WHEREAS, certain court decisions have limited the power of municipalities to ban or regulate the storage or transportation of nuclear materials within their municipal boundaries, and

WHEREAS, the Town Council, nonetheless desires to state its opposition to nuclear materials within the Town of Crested Butt and the State of Colorado.

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF CRESTED BUTTE, COLORADO:

Section 1. The Town Council of the Town of Crested Butte hereby declares the Town of Crested Butte to be a "Nuclear Free Zone", and declares its general opposition to the storage and transportation of nuclear materials within the Town of Crested Butte and the State of Colorado.

Section 2. The Town staff is hereby directed to take such positive steps to further the intent and direction of making Crested Butte a "Nuclear Free Zone" as are legally authorized to municipalities.

Section 3. The Town Clerk shall certify a copy of this Resolution to the Governor of Colorado, and such other local, state and federal officials that the Town Manager or Town Council may hereafter designate.

INTRODUCED, READ AND ADOPTED THIS 19TH DAY OF FEBRUARY, 1985, BY THE CRESTED BUTTE TOWN COUNCIL, AT ITS REGULAR MEETING.

TOWN OF CRESTED BUTTE, COLORADO

(seal)

By ______________________
Thomas S. Cox, Mayor

ATTEST:

Kerry Folger
Kerry Folger, Deputy Town Clerk

RESOLUTION NO. 6
Series of 1985

A RESOLUTION DECLARING OPPOSITION TO THE STORAGE AND TRANSPORTATION OF RADIOACTIVE SUBSTANCES AND OTHER HAZARDOUS MATERIALS IN THE TOWN OF DILLON AND ALONG HIGHWAY 6 AND SETTING FORTH DETAILS IN REGARD THERETO.

WHEREAS, the Town of Dillon, Colorado, is a statutory municipality existing under and by virtue of the Constitution and the laws of the State of Colorado, with all the powers conferred thereby; and

WHEREAS, the Town is intent on pursuing every legal and financially feasible possibility to prevent the transportation of radioactive substances and other hazardous waste materials through the Town of Dillon and along Highway 6; and

WHEREAS, Highway 6 bisects and is adjacent to the Town of Dillon and is extremely hazardous for trucks and other vehicular traffic becaus of adverse winter conditions, steep grades, vehicles being driven at excessive speeds in the summer, and the presence of drivers unqualified in mountain driving; and

WHEREAS, the Town Board of Trustees vehemently opposes the transportation of radioactive and other hazardous substances along Highway 6 because any accident involving nuclear or other hazardous wast along Highway 6 has the potential of contaminating the Town of Dillon residents; and

WHEREAS, the Town Board of Trustees is aware that certain court decisions have limited the ability of local governments to ban and regulate transportation and storage of radioactive and other hazardous materials on State and Federal highways; and

WHEREAS, the Town Board of Trustees desires to declare its stror opposition to the storage and transportation of radioactive and other hazardous materials within the Town of Dillon and along Highway 6; and

WHEREAS, the Town Board of Trustees wishes to declare its suppo for the disposal of nuclear waste by permanent entombment near the sites where it has been used, and further wishes to recommend the holding of joint congressional hearings on the matter of the disposal of nuclear waste;

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN BOARD OF TRUSTEES OF THE TOWN OF DILLON, COLORADO:

Section 1

The Town Board of Trustees of the Town of Dillon, Colorado, her declares its strong opposition to the storage and transportation of radioactive substances and other hazardous materials in the Town of Dillon and along Highway 6.

Section 2

The Town Board of Trustees hereby recommends permanent entombment near the sites where it has been used as an appropriate method for disposing of radioactive substances and other hazardous materials.

Section 3

The Town Board of Trustees hereby supports the holding of a joint congressional hearing on the issues of the disposal of radioactive substances and other hazardous materials.

Section 4

The Town Clerk shall certify a copy of this resolution to the Governor of the State of Colorado, and such other local, state and federal officials as the Town Administrator may deem appropriate.

INTRODUCED, READ, PASSED, AND ADOPTED at a regular meeting of the Town Board of Trustees of the Town of Dillon, Colorado, held on April 16, 1985.

Jim Hayes

Jim Hayes, Mayor

ATTEST:

Sally Rocco, Town Clerk

Commissioner GUSTAFSON moved adoption of the following Resolution:

BOARD OF COUNTY COMMISSIONERS

COUNTY OF EAGLE, STATE OF COLORADO

RESOLUTION NO. 85-23

DECLARATION OF OPPOSITION TO THE STORAGE AND TRANSPORTATION OF RADIOACTIVE NUCLEAR WASTE SUBSTANCES IN THE COUNTY OF EAGLE AND ALONG INTERSTATE HIGHWAY I-70, U.S. HIGHWAY NOS. 24 AND 131, AND EAGLE COUNTY ROAD NOS. P-293 AND P-301

WHEREAS, the County of Eagle, State of Colorado, is a body corporate and politic existing under and by virtue of the Constitution and laws of the State of Colorado with all of the powers conferred thereby; and

WHEREAS, the Board of County Commissioners of the County of Eagle, State of Colorado, hereinafter the "Board", is intent upon pursuing every legal and financially feasible possibility to maintain and protect the County of Eagle as a "Nuclear Free Zone"; and

WHEREAS, the Board finds that contamination by radioactive nuclear waste substances within the County of Eagle, by accident or intent, would have extremely detrimental effects upon the health, safety and welfare of the residents and visitors of, and businesses and wildlife within, the County of Eagle, as well as outside the territorial boundaries of the County of Eagle; and

WHEREAS, such detrimental effects referred to in the paragraph next above include, by way of example only, the potential contamination of domestic water supplies of local municipalities, in addition to the potential contamination of the Colorado River upon which the lower basin states rely pursuant to The Colorado River Compact, and upon which Mexico relies pursuant to the Mexican Treaty of 1944; and

WHEREAS, because Interstate Highway I-70 is the primary ground route for visitors and inhabitants traveling to and from the County of Eagle, the Board opposes the transportation of radioactive nuclear waste substances along Interstate Highway I-70; and

WHEREAS, the Board notes the already high accident rate involving truck traffic on Interstate Highway I-70 over Vail Pass and in the vicinity of the easterly entrance to the Glenwood Canyon during the winter months, primarily due to adverse weather conditions, the limiting nature of the natural geologic formations in such areas, and, with respect to Vail Pass, the steep grades; and

WHEREAS, since U.S. Highway Nos. 24 and 131, and Eagle County Road Nos. P-293 and P-301, located within the County of Eagle, State of Colorado, could also be readily improved to accomodate the transportation of radioactive nuclear waste substances through the County of Eagle, the Board also opposes the potential transportation of radioactive nuclear waste substances along the aforementioned transportation routes; and

WHEREAS, the Board is aware that certain court decisions have limited the ability of local governments to prohibit or regulate transportation and storage of radioactive nuclear waste substances on state and federal highways; and

WHEREAS, in light of the foregoing, the Board desires to voice its support for a congressional hearing to elicit and review in depth, substantive facts and the potential adverse effects pertaining to the transportation and storage of radioactive nuclear waste substances and, based thereon, to enact legislation prohibiting and/or effectively regulating the same; and

WHEREAS, the Board further desires to declare its opposition to the storage and transportation of radioactive nuclear waste substances in the County of Eagle and along Interstate Highway I-70, U.S. Highway Nos. 24 and 131, and Eagle County Road Nos. P-293 and P-301 and, therefore, desires that the County Manager and County Attorney participate with other local governments in a program for prohibiting or regulating the storage and transportation of radioactive nuclear waste substances within the County of Eagle and the other respective jurisdictions, consistent with such local governments' legal authority in such matters.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF THE COUNTY OF EAGLE, STATE OF COLORADO:

THAT, the Board hereby declares its opposition to the storage and transportation of radioactive nuclear waste substances in the County of Eagle and along Interstate Highway I-70, U.S. Highway Nos. 24 and 131, and Eagle County Road Nos. P-293 and P-301.

THAT, the Board advocates a congressional hearing to ascertain and determine the substantive facts and the potential adverse effects surrounding the storage and transportation, and the possible contamination therefrom, of radioactive nuclear waste substances and, based thereon, to enact legislation prohibiting and/or effectively regulating the same.

THAT, the Board further advocates the permanent storage and/or disposal of radioactive nuclear waste substances at the site of origin of the same.

THAT, the County Manager and County Attorney are hereby directed to participate in the development of recommendations with other similarly situated local governments to determine what positive steps such local governments can take, within their respective legal bounds, to prohibit or effectively regulate the storage and transportation of radioactive nuclear waste substances within the County of Eagle and the other respective jurisdictions.

THAT, the Clerk of the Board shall certify a copy of this Resolution to the Governor of the State of Colorado, and such other local, state and federal officials, as the County Manager deems appropriate.

MOVED, READ AND ADOPTED by the Board of County Commissioners of the County of Eagle, State of Colorado, at its regular meeting held the 5th day of March 1985.

COUNTY OF EAGLE, STATE OF COLORADO
By and Through its
BOARD OF COUNTY COMMISSIONERS

ATTEST:

By: Johnnette Phillips
Clerk of the Board of
County Commissioners

By: David E Mott
David E. Mott, Chairman

Richard L Gustafson
Richard L. Gustafson, Commissioner

Don H. Welch
Donald H. Welch, Commissioner

Commissioner Welch seconded adoption of the foregoing resolution. The roll having been called, the vote was as follows:

Commissioner David E. Mott Aye
Commissioner Richard L. Gustafson Aye
Commissioner Donald H. Welch Aye

This Resolution passed by UNANIMOUS vote of the Board of County Commissioners of the County of Eagle, State of Colorado.

STATE OF COLORADO)
)ss.
COUNTY OF GARFIELD)

At a .... meeting of the Board of County Commissioners for Garfield County, Colorado, held at the Courthouse in Glenwood Springs on ...., the ....day of ...., A.D., 19........, there were present:

.........................., Commissioner Chairman
.........................., Commissioner
.........................., Commissioner
.........................., County Attorney
.........................., Clerk of the Board

when the following proceedings, among others were had and done, to-wit:

RESOLUTION NO. 84-_____

RESOLUTION CONCERNED WITH THE TRANSPORTATION OF HAZARDOUS MATERIALS THROUGH GARFIELD COUNTY, COLORADO

WHEREAS, Garfield County, Colorado is a legal and political subdivision in the State of Colorado for which the Board of County Commissioners is authorized to act;

WHEREAS, the Board of County Commissioners has received an application from Mr. Paul M. Crawford for a text amendment to the Garfield County Zoning Resolution of 1978, which amendment would provide that no radioactive substance could be deposited or transported in Garfield County, Colorado;

WHEREAS, the Board has received the legal opinion of the County Attorney that as to the transportation of hazardous materials on Interstate 70, Highway 13, Highway 82 and Highway 133 and the railroad lines of the Rio Grande, that Garfield County does not have the legal authority to ban the transport of hazardous materials on said State and Federal highways; and

WHEREAS, consistent with its legal authority, the Board desires to declare its interest and concern in the transportation of hazardous (including radioactive) materials through Garfield County, Colorado.

NOW, THEREFORE, BE IT RESOLVED, by the Board of County Commissioners of Garfield County, Colorado as follows:

1. The Board of County Commissioners of Garfield County, Colorado hereby declares that the presence of hazardous material in Garfield County is a matter of public concern and the mishandling or misuse of hazardous material is contrary to the public health, safety and welfare of the citizens of Garfield County, Colorado.

2. That the County Manager is hereby directed to develop a work program to be presented in the Spring of 1985 to the Board of County Commissioners for approval to determine what positive steps Garfield County can take to express its concern about the transportation of radioactive and hazardous substances through Garfield County, Colorado.

3. That the Clerk and Recorder of Garfield County, Colorado shall certify a copy of this Resolution to the Governor of the State of Colorado as a means of expressing Garfield County's concern about the transportation of radioactive and hazardous materials on Interstate 70 through Garfield County, Colorado.

4. That the Clerk and Recorder of Garfield County, Colorado shall certify a copy of this Resolution to the Secretary of the Interstate Commerce Commission as a means of expressing its concern and interest in the transportation of radioactive and hazardous materials on the railroad line of the Rio Grande.

DATED this 5th day of November, 1984.

BOARD OF COUNTY COMMISSIONERS OF
GARFIELD COUNTY, COLORADO

ATTEST:

____
Mildred Alsdorf
Clerk to the Board

By Flaven Cerise
Chairman pro-tem

Upon motion duly made and seconded the foregoing Resolution was adopted by the following vote:

.....Flaven Cerise...........Aye
.....Jim Drinkhouse.....Aye
..............................Aye
Commissioners

STATE OF COLORADO)
)ss.
COUNTY OF GARFIELD)

I, ..., County Clerk and ex-officio Clerk of the Board of County Commissioners in and for the County and State aforesaid do hereby certify that the annexed and foregoing Order is truly copied from the Records of the Proceedings of the Board of County Commissioners for said Garfield County, now in my office.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said County, at Glenwood Springs, this .... day of ...., A.D. 19......

County Clerk and ex-officio Clerk of
the Board of County Commissioners

....

TOWN OF MT. CRESTED BUTTE, COLORADO
RESOLUTION NO. 8
SERIES, 1985

A RESOLUTION DECLARING THE TOWN OF MT. CRESTED BUTTE BE A NUCLEAR FREE ZONE, AND STATING THE OPPOSITION OF THE MT. CRESTED BUTTE TOWN COUNCIL TO THE STORAGE AND TRANSPORTATION OF NUCLEAR WASTE AND OTHER RADIO-ACTIVE SUBSTANCES WITHIN THE STATE OF COLORADO.

WHEREAS, the main economic support for the Town and citizens of Mt. Crested Butte comes from the tourism industry, and

WHEREAS, the Town Council finds that the contamination by radio-active substances, by accident or intent, presumptively interfers with the tourist and residential character of the Town of Mt. Crested Butte, and would have an adverse effect on the resident, visitors, businesses and wildlife in the Crested Butte area, and

WHEREAS, the transportation and storage of nuclear waste and other radio-active and/or nuclear materials within the State of Colorado would tend to reduce the desireability of Colorado as a tourist destination, and

WHEREAS, certain court decisions have limited the power of municipalities to ban or regulate the storage or transportation of nuclear materials within their municipal boundaries, and

WHEREAS, the Town Council, nonetheless desires to state its opposition to nuclear materials within the Town of Mt. Crested Butte and the State of Colorado.

NOW, THEREFORE, BE IT RESOLOVED BY THE TOWN COUNCIL OF THE TOWN OF MT. CRESTED BUTTE, COLORADO:

Section 1. The Town Council of the Town of Mt. Crested Butte hereby declares the Town of Mt. Crested Butte to be a "Nuclear Free Zone", and declares its general opposition to the storage and transportation of nuclear materials within the Town of Mt. Crested Butte and the State of Colorado.

Section 2. The Town staff is hereby directed to take such positive steps to further the intent and direction of making Mt. Crested Butte a "nuclear Free Zone" as are legally authorized to municipalities.

Section 3. The Town Clerk shall certify a copy of this Resolution to the Governor of Colorado, and such other local, state, and federal officials that the Town Manager or Town Council may hereafter designate.

INTRODUCED, READ AND ADOPTED THIS 19TH DAY OF FEBRUARY, 1985, BY THE MT. CRESTED BUTTE TOWN COUNCIL, AT ITS REGULAR MEETING.

TOWN OF MT. CRESTED BUTTE, COLORADO

BY: ______________________
Robert G.Godwin, Mayor

ATTEST:

Virginia Hamilton
Virginia Hamilton, Town Clerk

RESOLUTION NO. 84-133

RESOLUTION OF THE BOARD OF COUNTY COMMISSIONERS OF PITKIN COUNTY, COLORADO, DECLARING ITS OPPOSITION TO THE STORAGE AND TRANSPORTATION OF RADIO-ACTIVE SUBSTANCES IN PITKIN COUNTY AND ALONG INTERSTATE HIGHWAY I-70

RECITALS

1. Pitkin County, Colorado, is a home rule county existing under and by virtue of the Constitution and laws of the State of Colorado with all of the powers conferred thereby; and

2. The Board of County Commissioners has received an application from the Commonsense Coalition, including Tom Benton, Maxwell Aley and Paul M. Crawford, to enact legislation declaring Pitkin County as a "Nuclear-Free Zone"; and

3. The Board finds that contamination by radio-active substances, by accident or intent, presumptively interferes with the tourist and residential character of the County and would have an adverse effect on the residents, visitors, businesses and wildlife in the Aspen area; and

4. Because Interstate Highway I-70 is the main ground route for visitors and inhabitants traveling to and from Pitkin County, the Board also opposes the transportation of radio-active substances along Interstate Highway I-70; and

5. The Board is aware that certain court decisions have limited the ability of local governments to ban or regulate the transportation and storage of radio-active materials on state

and federal highways; and

6. The Board desires to declare its opposition to the storage and transportation of radio-active materials in the County and along Interstate Highway I-70, and therefore desires that the County Manager and County Attorney recommend a program for prohibiting or regulating the storage and transportation of radio-active materials in the County consistent with the County's legal authority in such matters.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF PITKIN COUNTY, COLORADO:

1. The Board hereby declares its general opposition to the storage and transportation of radio-active substances in Pitkin County and along Interstate Highway I-70.

2. The County Manager and County Attorney are hereby directed to develop a work program for making recommendations to determine what positive steps the Board can take to prohibit or regulate the storage and transportation of radio-active substances in the County.

3. The County Clerk and Recorder shall certify a copy of this resolution to the Governor of the State of Colorado, and such other local, state and federal officials as the County Manager may deem appropriate.

APPROVED this 10TH day of December, 1984.

BOARD OF COUNTY COMMISSIONERS
OF PITKIN COUNTY, COLORADO

By: Michael Kinsley
Michael Kinsley, Chairman

ATTEST:

Lew Scanlan
Deputy Clerk and Recorder

APPROVED AS TO FORM:

Thomas Fenton Smith
Thomas Fenton Smith
County Attorney

RESOLUTION NO 181

SERIES 1985

A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF SILVERTHORNE, COLORADO, DECLARING ITS OPPOSITION TO THE STORAGE OF TRANSPORTATION OF RADIO-ACTIVE SUBSTANCES AND OTHER HAZARDOUS MATERIALS IN THE TOWN OF SILVERTHORNE AND ALONG INTERSTATE HIGHWAY 70.

WHEREAS, the Town of Silverthorne, Colorado, is a statutory municipality existing under and by virtue of the Constitution and the laws of the State of Colorado, with all the powers conferred thereby; and

WHEREAS, the Town is intent on pursuing every legal and financially feasible possibility to prevent the transportation of radio-active substances and other hazardous waste materials through the Town of Silverthorne and along Interstate Highway 70; and

WHEREAS, Interstate Highway 70 bisects the Town of Silverthorne within the Blue River Valley, the Southern end of said valley, and is extremely hazardous for trucks and other vehicular traffic because of adverse winter conditions, steep grades, vehicles being driven at excessive speeds in the summer, and the presence of drivers unqualified in mountain driving; and

WHEREAS, the Board of Trustees vehemently opposes the transportation of radioactive and other hazardous substances along Interstate Highway 70 because any accident involving nuclear or other hazardous wastes along Interstate Highway 70 has the potential of contaminating Strait Creek, the Blue River, the Town's water supply and the headwaters of the Southwestern United States water supply; and

WHEREAS, the Board of Trustees is aware that certain court decisions have limited the ability of local governments to ban and regulate transportation and storage of radio-active and other hazardous materials on State and Federal highways; and

WHEREAS, the Board of Trustees desires to declare its strong opposition to the storage and transportation of radio-active and other hazardous materials within the Town of Silverthorne and along Interstate Highway 70, and therefore desires that the Town Administrator and Town Attorney recommend a program for prohibiting the storage and transportation of radio-active and other hazardous materials within the Town consistent with the Town's legal authority in such matters; and

WHEREAS, the Town Board of Trustees wishes to declare its support for the disposal of nuclear waste by permanent entombment near the sites where it has been used, and further wishes to recommend the holding of joint congressional hearings on the matter of the disposal of nuclear waste.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF SILVERTHORNE, COLORADO,

Section 1: The Board of Trustees of the Town of Silverthorne, Colorado hareby declares its general opposition to the storage and transportation of radio-active substances and other hazardous materials in the Town of Silverthorne and along Interstate Highway I-70.

Section 2: The Town Administrator and Town Attorney are hereby directed to develop a work program for making recommendations to determine what positive steps the Board of Trustees can take to prohibit or regulate the storage and transportation of radio-active and other hazardous substances in the Town of Silverthorne.

Section 3: The Town Clerk shall certify a copy of this resolution to the Governor of the State of Colorado, and such other local, state and federal officials, as the City Manager may deem appropriate.

INTRODUCED, READ, APPROVED AND ADOPTED BY A MAJORITY OF THE BOARD OF TRUSTEES OF THE TOWN OF SILVERTHORNE THIS *15th* DAY OF *April*, 1985.

TOWN OF SILVERTHORNE

William J. Schmidt

William J. Schmidt, Mayor

ATTEST:

Pat Easton

Pat Easton, Deputy Town Clerk

RESOLUTION NO. 85-47

Before the Board of County Commissioners of the

County of Summit

State of Colorado

OPPOSING THE STORAGE AND TRANSPORTATION OF NUCLEAR WASTE SUBSTANCES IN SUMMIT COUNTY

WHEREAS, for several years, the Board of County Commissioners has been very concerned about the extreme dangers associated with transporting hazardous materials through the mountain highways of Summit County, because of adverse winter conditions, steep grades and the presence of drivers inexperienced in mountain driving;

WHEREAS, decisions are presently being made within the Department of Energy which would designate a site for ultimate disposal of the most dangerous hazardous material - nuclear waste - in the Western United States and which would specify Interstate Highway 70 as a route for truck shipment of these materials to the disposal site;

WHEREAS, the Board of County Commissioners opposes the transport of radioactive materials along Interstate Highway 70 and U.S. Highway 6 because these roadways are the primary routes for visitors and inhabitants traveling to and from Summit County;

WHEREAS, the Board of County Commissioners further opposes the transport of these materials along Interstate Highway 70 because any accident involving nuclear waste has the potential of causing catastrophic damage in Summit County, including the contamination of Straight Creek, Dillon Reservoir and the Blue River; and

WHEREAS, the Board of County Commissioners wishes to declare its support for the disposal of nuclear waste by permanent entombment near the sites where it has been generated and further wishes to recommend the holding of joint congressional hearings on the matter of disposal of radioactive waste materials;

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF SUMMIT COUNTY, COLORADO, THAT:

Section 1. The Board hereby declares its strong opposition to the storage and transportation of radioactive nuclear waste substances in the County of Summit and along Interstate Highway 70 and U.S. Highway 6.

Section 2. The Board hereby advocates the permanent storage and/or disposal of nuclear waste materials near the sites of the nuclear power plants where such waste materials were produced;

Section 3. The Board hereby supports the holding of congressional hearings on the issue of disposal of radioactive materials.

Section 4. The County Clerk & Recorder shall certify a copy of this Resolution to the Governor of the State of Colorado and such other local, state and federal officials as the County Manager may deem appropriate.

ADOPTED this 17th day of April, 1985.

BOARD OF COUNTY COMMISSIONERS
OF SUMMIT COUNTY, COLORADO

By: Don Peterson
Don Peterson, Chairman

ATTEST:

Colleen Richmond
Colleen Richmond, Clerk & Recorder

STATE OF COLORADO } s.s.
COUNTY OF SUMMIT }
I hereby certify this document is a true and correct copy of the original record in my custody. Issued in Breckenridge this 17th
day of April 19 1985
Colleen Richmond
COLLEEN RICHMOND
Summit County, Colorado
[illegible]

RESOLUTION NO. 85-11

A RESOLUTION DECLARING OPPOSITION TO THE STORAGE AND TRANSPORTATION OF RADIOACTIVE SUBSTANCES AND OTHER HAZARDOUS MATERIALS IN AND ALONG U.S. 40 AND SETTING FORTH DETAILS IN REGARD THERETO.

WHEREAS, The City of Steamboat Springs, Colorado, is a home rule municipality existing under and by virtue of the Constitution and the Laws of the State of Colorado with all the powers conferred thereby; and

WHEREAS, the City of Steamboat Springs is intent on pursuing every legal and financially feasible possiblility to prevent the transportation of radioactive substances and other hazardous waste materials through the City of Steamboat Springs and along U.S. Highway 40; and

WHEREAS, U.S. Highway 40 bisects the City of Steamboat Springs within the Yampa Valley at the western foot of Rabbit Ears Pass, and is extremely hazardous for trucks and other vehicular traffic because of adverse winter conditions, steep grades, vehicles being driven at excessive speeds in the summer, and the presence of drivers unqualified in mountain driving; and

WHEREAS, the City Council vehemently opposes the transportation of radioactive and other hazardous substances upon U.S. Highway 40 and because any accident involving nuclear or other hazardous wastes along U.S. Highway 40 has the potential of contaminating the Yampa River and the head waters of the Southwestern United States water supply and the City of Steamboat Springs; and

WHEREAS, the City Council is aware that certain court decisions have limited the ability of local governments to ban and regulate transportation and storage of radioactive and other hazardous materials on State and Federal highways; and

WHEREAS, the City Council desires to declare its strong opposition to the storage and transportation of radioactive and other hazardous materials within the City of Steamboat Springs and along U.S. Highway 40, and therefore desires that the City Manager and City Attorney recommend a program for prohibiting the storage and transportation of radioactive and other hazardous materials within the City consistent with the City's legal authority in such matters; and

WHEREAS, the City Council wishes to declare its support for the disposal of nuclear waste by permanent entombment near the sites where it has been used, and further wishes to recommend the holding of joint congressional hearings on the matter of the disposal of nuclear waste.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF STEAMBOAT SPRINGS, AS FOLLOWS:

1. The City Council hereby declares its strong opposition to the storage and transportation of radioactive substances and other hazardous materials in the City of Steamboat Springs and along U.S. Highway 40.

2. The City Council hereby recommends permanent entombment near the sites where it has been used as an appropriate method for disposing of radioactive substances and other hazardous materials.

3. The City Council hereby supports the holding of a joint congressional hearing on the issues of the disposal of radioactive substances and other hazardous materials.

4. The City Manager and City Attorney are hereby directed to develop recommendations and to determine what positive steps the City Council can take to prohibit the storage and transportation of radioactive materials and other hazardous materials in the City of Steamboat Springs.

5. The City Clerk shall certify a copy of this resolution to the Governor of the State of Colorado, and such other local, state and federal officials as the City Manager may deem appropriate.

PASSED, ADOPTED AND APPROVED this 19th day of March, 1985

Dean W. Sandvik
City Council President

ATTEST:

Vicki Marcy

Vicki Marcy, City Clerk

TOWN OF TELLURIDE
BOX 397 TELLURIDE, CO. 81435 303-728-38[illegible]

I, Margaret R. Howlett, Town Clerk of the Town of Telluride, Colorado, do hereby certify that the attached is a true and correct copy of Resolution No. 7, Series 1985, the original of which is on file at my office, Town Hall, Telluride, Colorado.

Signed: Margaret Howlett
Margaret R. Howlett
Town Clerk

Date: 3/25/85

RESOLUTION NO. 7

SERIES 1985

A RESOLUTION DECLARING THE TOWN OF TELLURIDE BE A NUCLEAR FREE ZONE, AND STATING THE OPPOSITION OF THE TELLURIDE TOWN COUNCIL TO THE STORAGE AND TRANSPORTATION OF NUCLEAR WASTE AND OTHER RADIO-ACTIVE SUBSTANCES WITHIN THE STATE OF COLORADO.

WHEREAS, the main economic support for the Town and citizens of Telluride comes from the tourism industry, and

WHEREAS, the Town Council finds that the contamination by radio-active substances, by accident or intent, presumptively interferes with the tourist and residential character of the Town of Telluride, and would have an adverse effect on the residents, visitors, businesses and wildlife in the Telluride area, and

WHEREAS, the transportation and storage of nuclear waste and other radio-active and/or nuclear materials within the State of Colorado would tend to reduce the desirability of Colorado as a tourist destination, and

WHEREAS, certain court decisions have limited the power of municipalities to ban or regulate the storage or transportation of nuclear materials within their municipal boundaries, and

WHEREAS, the Town Council, nonetheless desires to state its opposition to nuclear materials within the Town of Telluride and the State of Colorado.

NOW, THEREFORE, BE IS RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF TELLURIDE, COLORADO:

Section 1. The Town Council of the Town of Telluride hereby declares the Town of Telluride to be a "Nuclear Free Zone", and declares its general opposition to the storage and transportation of nuclear materials within the Town of Telluride and the State of Colorado.

Section 2. The Town staff is hereby directed to take such positive steps to further the intent and direction of making Telluride a "Nuclear Free Zone" as are legally authorized to municipalities.

Section 3. The Town Clerk shall certify a copy of this Resolution to the Governor of Colorado, and such other local, state, and federal officials that the Town Manager or Town Council may hereafter designate.

INTRODUCED, READ AND ADOPTED THIS 21st DAY OF March, 1985, by the Telluride Town Council, at its regular meeting.

TOWN OF TELLURIDE, COLORADO

By: ______________________
John Micetic, Mayor

ATTEST:

Margaret E. Howlett
Margaret Howlett, Town Clerk

ADOPTED BY THE
MAYOR AND COUNCIL

MEMORIAL

AT THE REQUEST OF COUNCILMAN VOLGY, A MEMORIAL RELATING TO THE TRANSPORTATION OF HIGH LEVEL NUCLEAR WASTES ACROSS WESTERN STATES TO A PERMANENT WASTE REPOSITORY IN UTAH, WASHINGTON, OR NEVADA.

BE IT RESOLVED BY THE MAYOR AND COUNCIL OF TUCSON, ARIZONA, AS FOLLOWS:

WHEREAS, the Department of Energy, pursuant to the Nuclear Waste Policy Act of 1983, 42 U.S.C.A. Secs. 10101-10226, has selected five possible sites for permanent storage of high level nuclear wastes; and

WHEREAS, three out of the five proposed sites are located in western states, resulting in the transportation of these wastes, over interstate highways, across many western states; and

WHEREAS, the City of Tucson is situated on Interstate 10, a possible route for trucks carrying the high level nuclear wastes; and

WHEREAS, contamination of the Colorado River watershed from a shipment of high level nuclear wastes is possible; and

WHEREAS, the City of Tucson is scheduled to receive Colorado River water through the Central Arizona project by 1992; and

WHEREAS, the City of Tucson is opposed to attempts by other regions to use western states as a dumping ground for nuclear and other hazardous wastes; and

WHEREAS, the City of Tucson shares the concern of citizens living in other potential western "corridor" states; and

WHEREAS, the City of Tucson shares the concern of citizens living near "on site" nuclear waste storage facilities, it supports the formation of an agency, modeled after N.A.S.A., which would enlist experts to explore non-storage solutions to the nuclear waste build-up problem,

THEREFORE, the City of Tucson opposes the location of a permanent high level nuclear waste repository in Washington, Utah, or Nevada; and opposes the transportation of high level nuclear wastes across western states; and favors continued "on site" storage and the formation of an agency, modeled after N.A.S.A., to investigate a long-term non-storage solution to the nuclear waste build-up.

town of vail
75 south frontage road
vail, colorado 81557
(303) 476-7000

office of the town manager

March 7, 1985

The Honorable Richard D. Lamm
Governor
Executive Chambers
136 State Capital
Denver, Colorado 80203-1792

Dear Governor Lamm:

The Vail Town Council has adopted a very strong resolution declaring opposition to the storage and transportation of radioactive substances and other hazardous materials in the Town of Vail and along Interstate Highway 70 (see copy enclosed). The Town of Vail is extremely concerned about this problem for the following reasons:

1. The Gore Valley is very narrow and is bisected by Interstate Highway 70 from Vail Pass at the east to Dowd Junction at the west. It is extremely hazardous for trucks and other vehicular traffic because of adverse winter conditions, steep grades, vehicles being driven at excessive speeds in the summer, and the presence of drivers unqualified in mountain driving;

2. Any accident involving nuclear or other hazardous materials along Interstate Highway 70 within the Gore Valley has the strong potential of contaminating Gore Creek, the Eagle River and the headwaters of the southwestern United States water supply.

The Town of Vail recommends that permanent entombment of radioactive material and other hazardous substances is a more appropriate method of disposal for these materials. Also, the Vail Town Council strongly supports the Common Sense Coalition in requesting joint congressional hearings on the issues of disposal of radioactive substances and other hazardous materials.

The Town of Vail would appreciate anything you can do to assist us in addressing this problem.

Sincerely,

Ron Phillips

Rondall V. Phillips
Town Manager

RVP/jh

RESOLUTION NO. 6
Series of 1985

A RESOLUTION DECLARING OPPOSITION TO THE STORAGE AND TRANSPORTATION OF RADIOACTIVE SUBSTANCES AND OTHER HAZARDOUS MATERIALS IN THE TOWN OF VAIL AND ALONG INTERSTATE HIGHWAY 70 AND SETTING FORTH DETAILS IN REGARD THERETO.

WHEREAS, the Town of Vail, Colorado, is a home rule municipality existing under and by virtue of the Constitution and the laws of the State of Colorado, with all the powers conferred thereby; and

WHEREAS, the Town is intent on pursuing every legal and financially feasible possibility to prevent the transportation of radioactive substances and other hazardous waste materials through the Town of Vail and along Interstate Highway 70; and

WHEREAS, Interstate Highway 70 bisects the Town of Vail within the Gore Valley and Vail Pass at the eastern end of said valley and Dowd Junction at the western end of said valley, and is extremely hazardous for trucks and other vehicular traffic because of adverse winter conditions, steep grades, vehicles being driven at excessive speeds in the summer, and the presence of drivers unqualified in mountain driving; and

WHEREAS, the Town Council vehemently opposes the transportation of radioactive and other hazardous substances along Interstate Highway 70 because any accident involving nuclear or other hazardous wastes along Interstate Highway 70 has the potential of contaminating Gore Creek, the Eagle River, and the headwaters of the Southwestern United States water supply; and

WHEREAS, the Town Council is aware that certain court decisions have limited the ability of local governments to ban and regulate transportation and storage of radioactive and other hazardous materials on State and Federal highways; and

WHEREAS, the Town Council desires to declare its strong opposition to the storage and transportation of radioactive and other hazardous materials within the Town of Vail and along Interstate Highway 70, and therefore desires that the Town Manager and Town Attorney recommend a program for prohibiting the storage and transportation of radioactive and other hazardous materials within the Town consistent with the Town's legal authority in such matters; and

WHEREAS, the Town Council wishes to declare its support for the disposal of nuclear waste by permanent entombment near the sites where it has been used, and further wishes to recommend the holding of joint congressional hearings on the matter of the disposal of nuclear waste;

NOW, THEREFORE, BE IT RESOLVED BY THE TOWN COUNCIL OF THE TOWN OF VAIL, COLORADO:

Section 1

The Town Council of the Town of Vail, Colorado, hereby declares its strong opposition to the storage and transportation of radioactive substances and other hazardous materials in the Town of Vail and along Interstate Highway 70.

Section 2

The Town Council hereby recommends permanent entombment near the sites where it has been used as an appropriate method for disposing of radioactive substances and other hazardous materials.

Section 3

The Town Council hereby supports the holding of a joint congressional hearing on the issues of the disposal of radioactive substances and other hazardous materials.

Section 4

The Town Manager and Town Attorney are hereby directed to develop recommendations and to determine what positive steps the Town Council can take to prohibit the storage and transportation of radioactive and other hazardous substances in the Town of Vail.

Section 5

The Town Clerk shall certify a copy of this resolution to the Governor of the State of Colorado, and such other local, state and federal officials as the Town Manager may deem appropriate.

INTRODUCED, READ, PASSED, AND ADOPTED at a regular meeting of the Town Council of the Town of Vail, Colorado, held on March 5, 1985.

Paul R. Jonnston, Mayor

ATTEST:

Pamela A. Brandmeyer, Town Clerk

COLORADO ASSOCIATION OF SKI TOWNS

RESOLUTION

A resolution declaring the opposition of the Colorado Association of Ski Towns to the storage and transportation of nuclear waste and other radio-active substances within the State of Colorado.

WHEREAS, a major economic support for the State of Colorado and its citizens is derived from the tourism industry, and

WHEREAS, the contamination by radio-active or nuclear materials would adversely affect the citizens, visitors, wildlife and economies of the State of Colorado, and

WHEREAS, the transportation and storage of nuclear waste and other radio-active and/or nuclear materials within the State of Colorado would tend to reduce the desirability of Colorado as a tourist destination, and

WHEREAS, certain court decisions have limited the power of municipalities to ban or regulate the storage or transportation of nuclear materials within their municipal boundaries, and

WHEREAS, the Colorado Association of Ski Towns nonetheless wants to state its opposition to nuclear and radio-active materials within the State of Colorado.

NOW, THEREFORE, BE IT RESOLVED BY THE COLORADO ASSOCIATION OF SKI TOWNS, that:

(1) The Colorado Association of Ski Towns declares the State of Colorado should be a nuclear-free zone and declares its general opposition to the storage and transportation of nuclear materials within the State of Colorado.

(2) This matter is of such importance and national significance that the Colorado Association of Ski Towns requests that a joint congressional hearing be held to discuss the issue of transportation of nuclear materials.

(3) The Colorado Association of Ski Towns further urges legislation be adopted requiring that all radio-active and/or nuclear wastes be required to be permanently entombed on the site where it is produced.

ADOPTED this 5th day of April, 1985.

COLORADO ASSOCIATION OF SKI TOWNS

Thomas S Cox

Thomas S. Cox, President

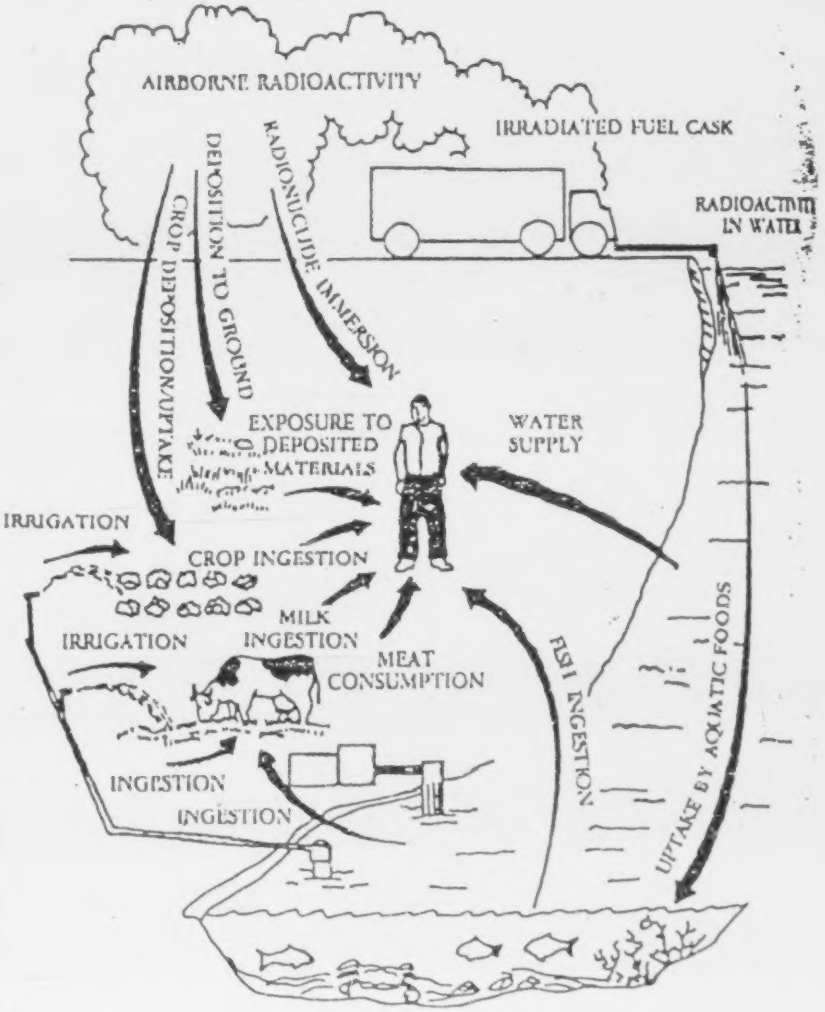
ATTEST:

William Crank

William V. Crank, Secretary

Figure 2-6.

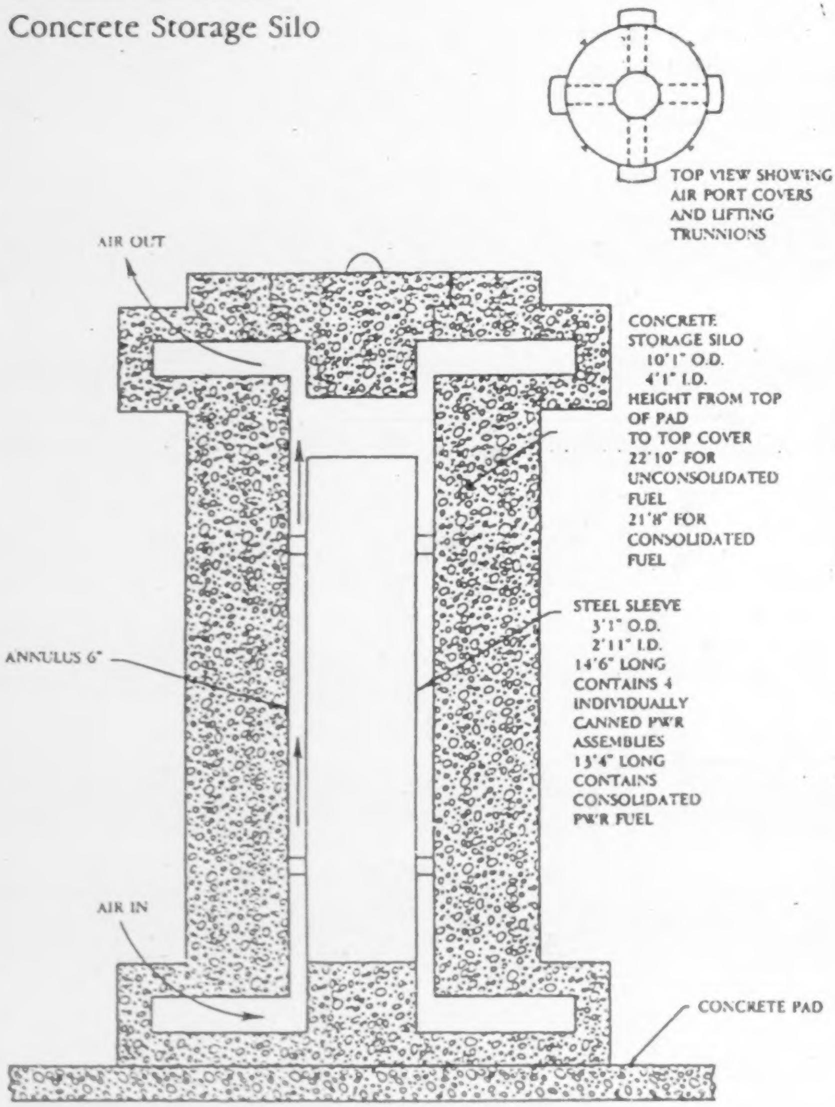
Pathways by which Humans May Be Exposed to Radiation Released from Transportation Casks.


AIRBORNE RADIOACTIVITY
IRRADIATED FUEL CASK
RADIONUCLIDE IMMERSION
DEPOSITION TO GROUND
CROP DEPOSITION/UPTAKE
RADIOACTIVITY IN WATER
EXPOSURE TO DEPOSITED MATERIALS
WATER SUPPLY
IRRIGATION
CROP INGESTION
MILK INGESTION
IRRIGATION
MEAT CONSUMPTION
FISH INGESTION
UPTAKE BY AQUATIC FOODS
INGESTION
INGESTION

Based on Fig. 4-1, (NRC, 1980b).

Figure 7-4.

Concrete Storage Silo


TOP VIEW SHOWING
AIR PORT COVERS
AND LIFTING
TRUNNIONS
AIR OUT
CONCRETE
STORAGE SILO
10'1" O.D.
4'1" I.D.
HEIGHT FROM TOP
OF PAD
TO TOP COVER
22'10" FOR
UNCONSOLIDATED
FUEL
21'8" FOR
CONSOLIDATED
FUEL
STEEL SLEEVE
3'1" O.D.
2'11" I.D.
14'6" LONG
CONTAINS 4
INDIVIDUALLY
CANNED PWR
ASSEMBLIES
13'4" LONG
CONTAINS
CONSOLIDATED
PWR FUEL
ANNULUS 6"
AIR IN
CONCRETE PAD

Each silo, containing four PWR assemblies in individual containers, sits on a concrete pad. Heat from the fuel is dissipated into the surrounding air. The silos are loaded through the top, either in the storage yard with a special transporter, or at the storage pool, and carried out to the yard by a heavy-duty truck. From (Johnson, 1981).

Table 2-3.

Radionuclides With Significant Health Implications[a] in an Irradiated Fuel Transport Accident

Radionuclide	Half-Life	Critical Organ
Cobalt-60[b]	5.26 yr	GI tract
Krypton-85	10.8 yr	Lung, Whole body
Strontium-90/Yttrium-90[c]	28.1 yr/64h	Bone
Ruthenium-106/Rhodium-106[c]	1 yr/130 min	GI tract, Lung
Tellurium-125m/Antimony-125[c]	58d/2.7 yr	Kidney, Lung
Tellurium-127m/Antimony-127[c]	109d/3.8d	Kidney, Lung
Cesium-134	2.05 yr	Whole body, Lung
Cesium-137/Barium-137m[c]	30.0 yr	Whole body, Lung
Cerium-144/Praseodymium-144[c]	285d/17.3 min	Bone, GI tract

[a] Data from (UCS, 1978). These radionuclides emit beta and gamma radiation.

[b] Cobalt-60 is present in the fuel cladding.

[c] The second isotope in each set is a short half-life daughter of the first isotope.

REMARKS OF ROBERT R. LOUX

Director, Nuclear Waste Project Office

The Dept. of Energy's Mission Plan

Senate Environment Committee

October 29, 1985

Mr. Chairman, and members of the Committee, my name is Robert R. Loux, Director of Nevada's Nuclear Waste Office, representing the State of Nevada. I appreciate very much the opportunity to submit these remarkds today on behalf of the State. While I have submitted written comments on the Department's Mission Plan for the record encompassing a variety of issues contained therein, I believe that the most critical issue to emerge is the timing of the preliminary determination of suitability as required by section 114 (f) of the Nuclear Waste Policy Act.

It will come as no surprise, I believe, to learn that the State of Nevada does not concur with the interpretation of Section 114 (f) of the NWPA by the Department of Energy, particularly its view as to the timing of the preliminary determinations of site suitability.

Let me very briefly explain Nevada's view as to the appropriate construction of that section, and what it requires of the Secretary of Energy. I intend no detailed legal analysis or argument, but merely wish to highlight certain points which we think support Nevada's, and other states, views on this matter, and to touch upon the State's concern that determinations of suitability, with great potential to effect the health and safety of its citizens, be made with as complete information as possible.

First, of course, central to a proper interpretation of Section 114 (f) are answers to two critical questions: 1. At what point in the site selection and characterization process is the Secretary required to make his preliminary determination of site suitability?; and 2. Must the Secretary preliminarily determine, after the completion of site characterization, that a minimum of three sites are suitable for development as repositories? We answer those questions differently than the Department; that is, the preliminary determination of suitability must be made only upon the completion, or at least substantial completion, of characterization activities at all three sites, and the Secretary must make the preliminary determination that three sites are suitable for development as repositories.

Let me state briefly some points which I think support the correctness of Nevada's view as to that timing.

First, the language of the critical sentence in Section 114(f) itself supports that position. The mere application of fundamental principals of English grammar, we feel, preclude any other interpretation. In simple, straightforward English Congress has told the Secretary that, in drafting his final environmental impact statement, he shall consider as alternates three candidate sites where (1) site characterization has been completed, and (2) where he has made a preliminary determination that such sites are suitable for development as repositories. Had Congress chosen to internally invert (1) and (2) some support for the Secretary's view that the preliminary determination of suitability can take place at the commencement, rather than the completion, of characterization might be found. But Congress did not choose to write that sentence in the manner in which the Secretary reads it.

The Department's interpretation also ignores, Nevada submits, the language of Section 114 (a) (1) (D) which requires the Secretary to make available to the public and submit to the President a comprehensive statement of the basis for his recommendaiton of any site for a repository, to include: "(a) final environmental impact statement...... including an analysis of the consideration given by the Secretary to not less than three candidate sites for the first proposed repository or to all of the characterized sites for the development of subsequent repositories, with respect to which characterization is completed under Section 113, ... (Emphasis supplied). That language clearly requires the Secretary's consideration be given only to sites at which characterization is complete.

The legislative history of the NWPA also supports this interpretation. In the floor debate proceeding passage of HR 3809 in the House of Representatives on December 2, 1982, Congressman Ottinger, whom, you know, was chairman of one of the principal subcommittees in the House with jurisdiction over the nuclear waste legislation, and who was intimately involved in fashioning the final version of the act, explained the provisions of Section 114 (f).

Congressman Ottinger said, for example: "The Secretary is required, with respect to alternative sites, to make a preliminary determination of suitability. It is envisioned that this preliminary determination would occur late in the site characterization program. It would make little sense for this determination to be made prior to testing at-depth, and consequently prior to a detailed understanding of the site's geologic characteristics.

In addition to the preliminary determination of site suitability, there is the requirement that site characterization activities be complete at the three sites. The intent behind this requirement is to once again insure that all sites being characterized are given equal consideration as to their suitability to prevent the site selection process from becoming a stacked deck for or against a specific site". These remarks are found, Mr. Chairman,at page H8796 of the December 2, 1982, Congressional Records.

It is true that the Senate added, to the relevant sentence in Section 114 (f), the language "consistent with the guidelines promulgated under Section 112 (a)". It is noteworthy, however, that the Senate amendment referred to all of the Section 112 (a) guidelines, and not only to "each such guideline ~~that~~ does not require site characterization as a prerequisite for application of such guideline".

Finally, one brief observation with respect to the meaning of the word "preliminary". We suggest that there is a very valid reason for the selection of that word by the Congress. The Secretary, under the NWPA, never makes the ultimate determination that a site is suitable for development as a repository. Neither, for that matter, does the President, who only recommends to Congress a site which he considers qualified for the application for a construction authorization. It is then the Nuclear Regulatory Commission which makes the ultimate or "final" determination that any site is suitable for development as a repository, by issuing a construction authorization and a subsequent license to receive and possess. Thus any action with respect to a determination of site suitability by the Secretary, taken at any point in the program, including the completion of site characterization activities, is by its very nature preliminary, because under the Act the final decision in that regard has been reserved by the Congress to the Nuclear Regulatory Commission.

There are very sound reasons, of course, why Congress chose to write section 114 (f) as it did, and why Nevada takes the position that it expresses here today. Both common sense and responsible scientific methodology require, we submit, that any preliminary determination of site suitability follow, rather than proceed, the completion, or at least substantial completion, of site characterization activities. In any program of this nature, with the potential for such adverse impacts on the public health and safety, and the quality of environment surrounding the repository, substantive decisions should be made as late as possible. It makes no sense whatsoever to make such determinations prior to the onset of the detailed scientific investigation. That is, we suggest, tantamount to asking a jury to preliminarily determine the guilt or innocence of an accused before testimony has even commenced.

A passage from the Department's Mission Plan highlights the fallacy of the Department's interpretation. At page 142 of volume II of the Mission Plan, the Record of Responses To Public Comments, the Department says: "The DOE's preliminary determination of site suitability means that DOE believes a site warrants further investigation or characterization . . . . a preliminary determination of site suitability means that there are no geologic, hydrologic, or engineering data that prove the site is not suitable for further investigation."

Two points, demonstrating the weakness of the Departments interpretation, are immediately obviously from that quoted language. First, section 114 of the Act does not say that the Secretary shall make a preliminary determination that a site "warrants further investigation or characterization". The Act says that the Secretary shall consider as alternatives three sites at which he "has made a preliminary determination that such sites are suitable for development as repositories consistent with the guidelines promulgated under section 112 (a)." There is a world of difference between determining that a site is suitable for further investigation or characterization, and that a site is suitable for development as a repository. Yet the Department obviously equates the two.

Secondly, its simply ridiculous to say that section 114 (f)'s requirement can be satisfied by determining that there are no geologic, hydrologic, or engineering data to prove that a site is not suitable for further investigation. That test could be satisfied almost anywhere in the country. All DOE would have to do is locate a site which was not disqualified because of the population factor contained in section 112 (a) of the act, and did not sit astride a major active fault or volcano, and it could be said that no data exists which proves that the site is not suitable for further investigation. Indeed, under that language, the less information and data available the better, since no information means that there is nothing to prove that a site in unsuitable for further investigation or characterization. Such an interpretation makes an absolute mockery of not only the language of section 114 (f) but Congress' intent in choosing that language.

Let me suggest a worse case scenario which could easily flow from acquiescing in in the Departments suggested timing of its preliminary determination. Suppose, for example, that the Department makes those determinations in the Fall of this year, as they now intend based in many cases on very preliminary, and sometimes questionable data. Let me further suggest that at the conclusion of characterizing three sites only one site is determined to be suitable for development as a repository, and that only marginally so. The Department, assuming it survived the notice of disapproval process, would then come to the Nuclear Regulatory Commission with an application for a construction authorization for a site of dubious physical integrity, thus putting the political onus on the Commission and Congress because of the years of effort, the impending acceptance date, and the hundreds of millions of dollars expended, to approve what may later turn out to be a bad site.

Finally, Mr. Chairman, we urge that, if the Department is to continue to insist upon its view as to the timing of the preliminary determinations, that Nuclear Regulatory Commission needs to revisit entirely the question of concurrence in the Department's final siting guidelines. The subjective nature of those guidelines already permits, we feel, the ultimate selection decisions to be made on a subjective basis, rather than based on firm, objective scientific considerations. But if the preliminary determination that a site is suitable for a development of a repository is to be made before characterization is complete, or even begun, and thus before the whole range of confirmed scientific data necessary to make an informed, intelligent decision is even available, then those guidelines are not only statutorily deficient, but wholly inadequate and incapable of insuring, with any degree of confidence, that selection decisions, and the health and safety considerations implicated in those decisions, have been made on the most objective, defensible scientific grounds possible.

In conclusion, Mr. Chairman, Nevada takes strong exception to the Department's interpretation of section 114 (f) allowing it to make its preliminary determination of site suitability before characterization even commences. We urge the Department to resubmit guidelines which allow for the selection of sites only on an objective scientific basis.

Again, Mr. Chairman, I appreciate very much the opportunity to make these remarks on behalf of the State of Nevada. Should you or any committee members have any questions, I would, of course, be happy to answer them.

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